Smithsonian

February 1997

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The confectioner's art (p. 42)

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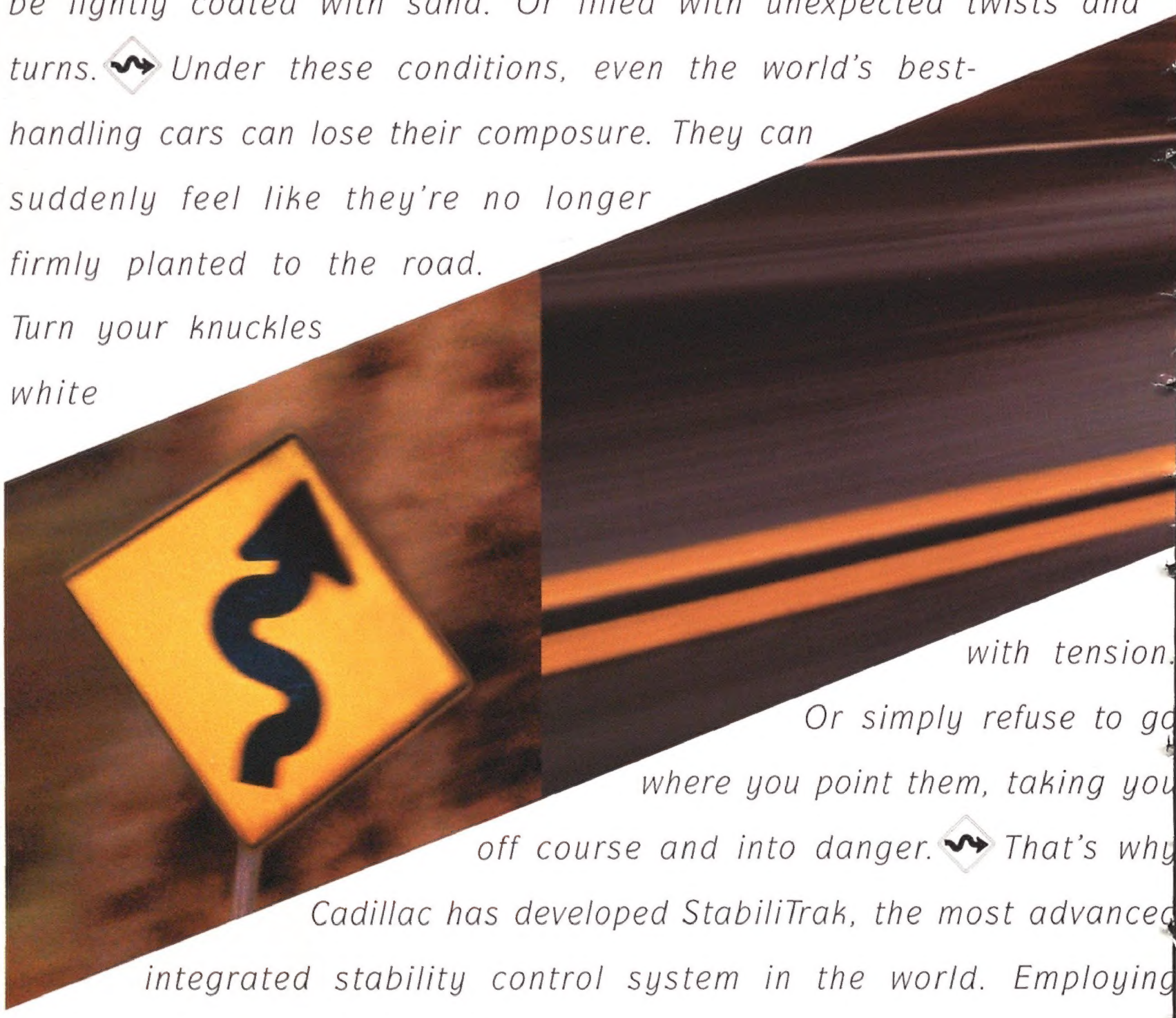

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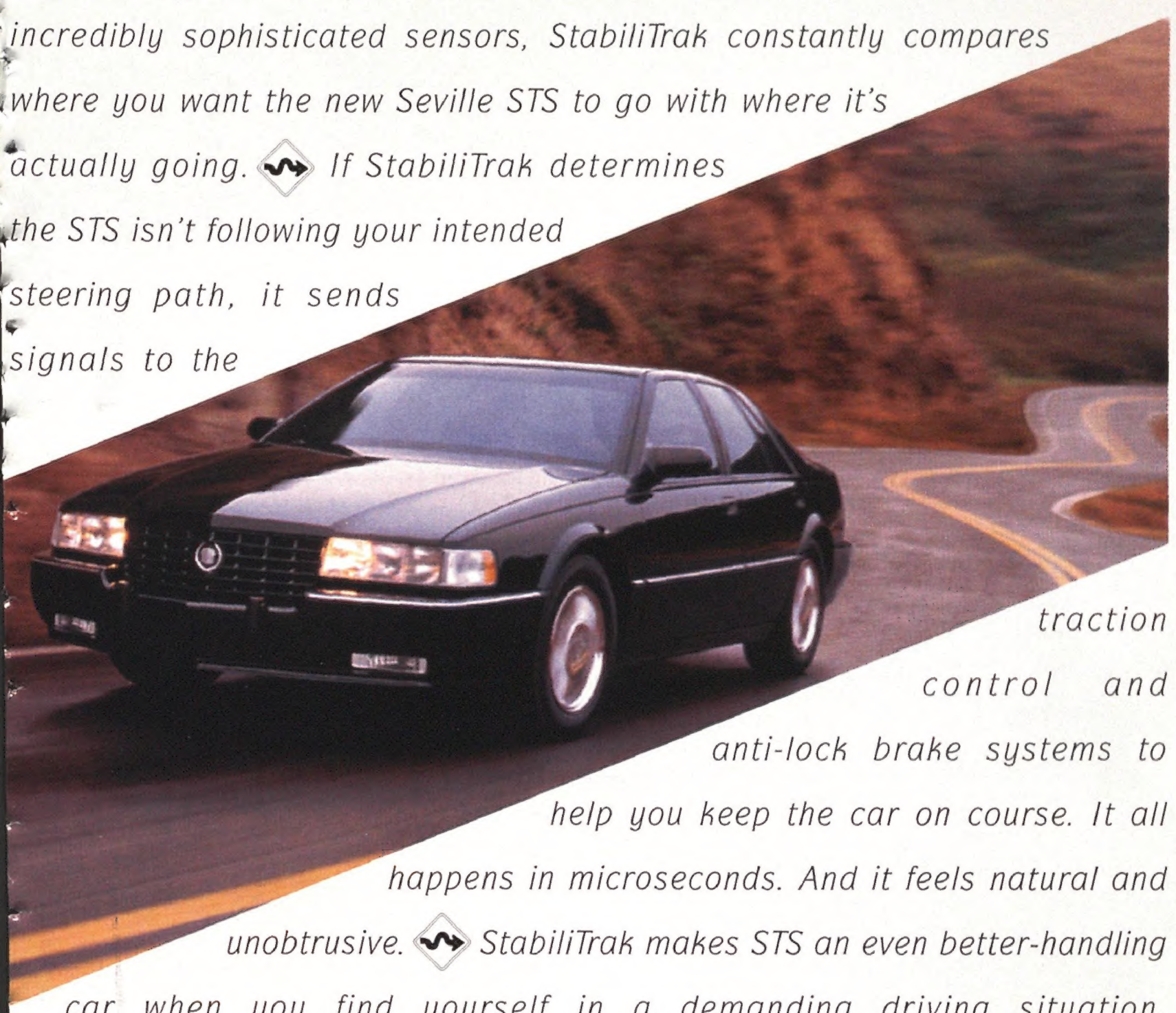

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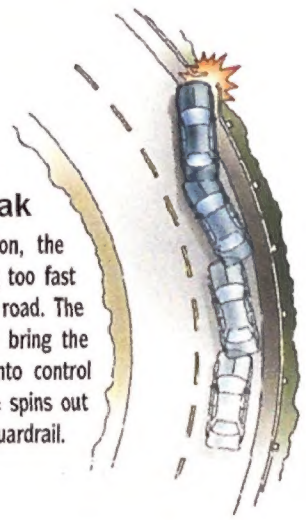

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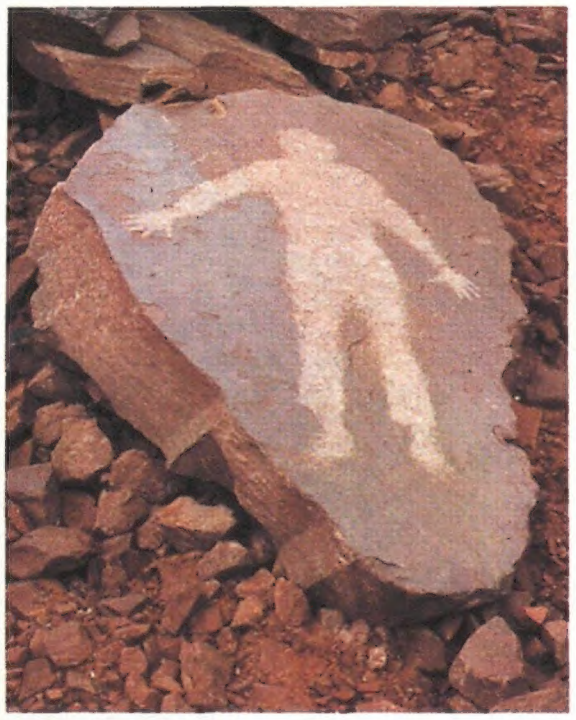
Smithsonian *features*

February 1997
Volume 27, Number 11



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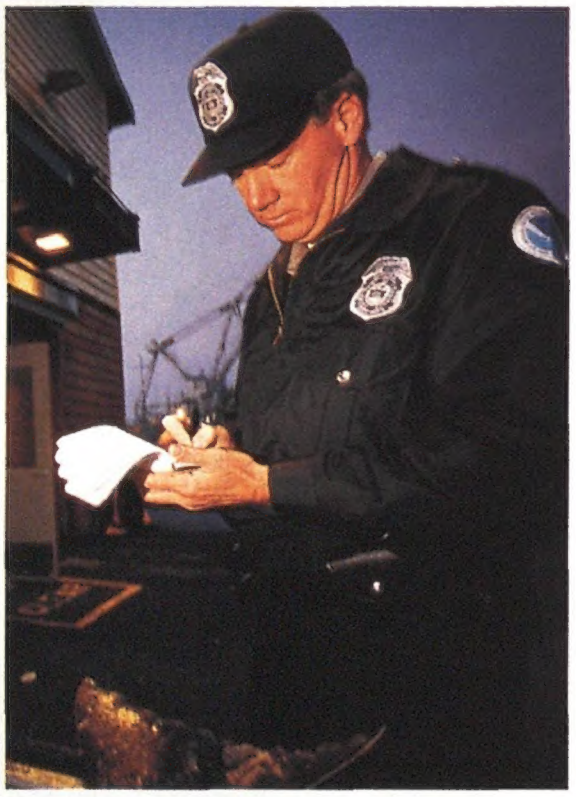

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Smithsonian *departments*

February 1997
Volume 27, Number 11

Cover

Cover:
No, it did not come from a mix. This croquembouche, the traditional French wedding cake, is the work of master pastry chef Jacques Torres. Made of bite-size cream puffs double-dipped in caramel, it's adorned with sugar flowers, leaves and ribbon, and sugar-syrup "angel hair" (p. 42)
Photograph by John Uher

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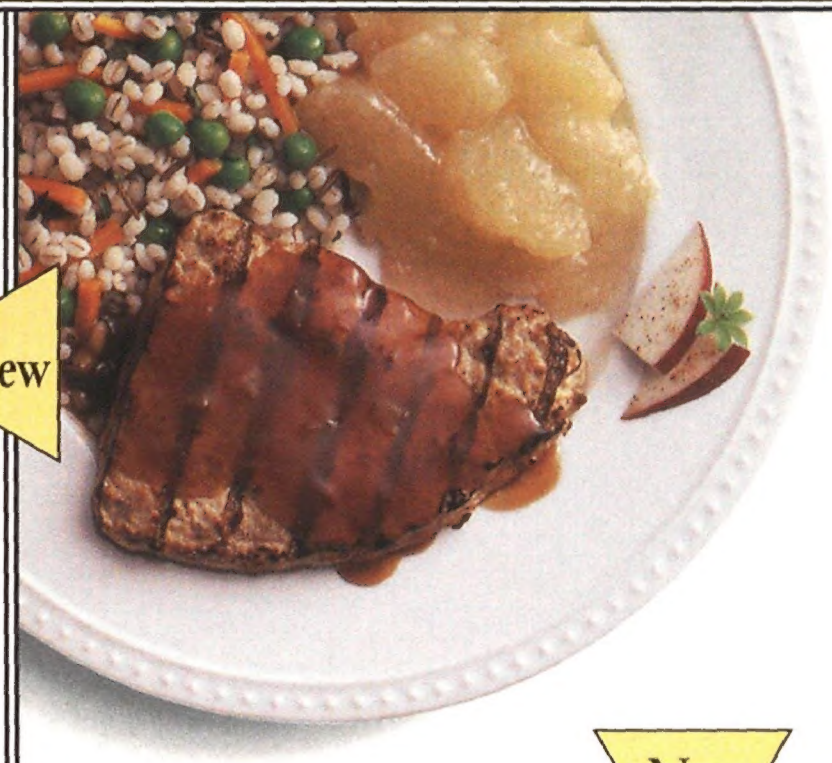
New



Grilled Pork with Apple BBQ Glaze
4g fat

New

Grilled Peppercorn Steak
6g fat

New

Penne Pasta with Italian Sausage
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New

Herb Baked Fish
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New

Grilled Chicken Sonoma
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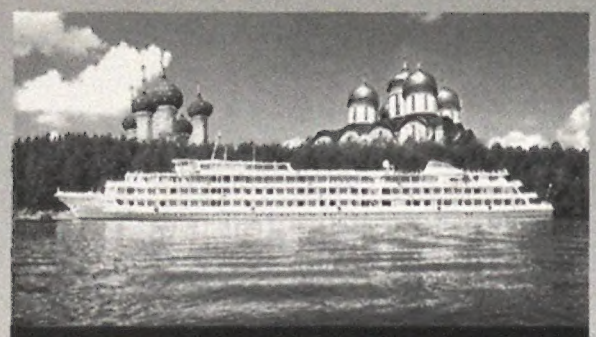

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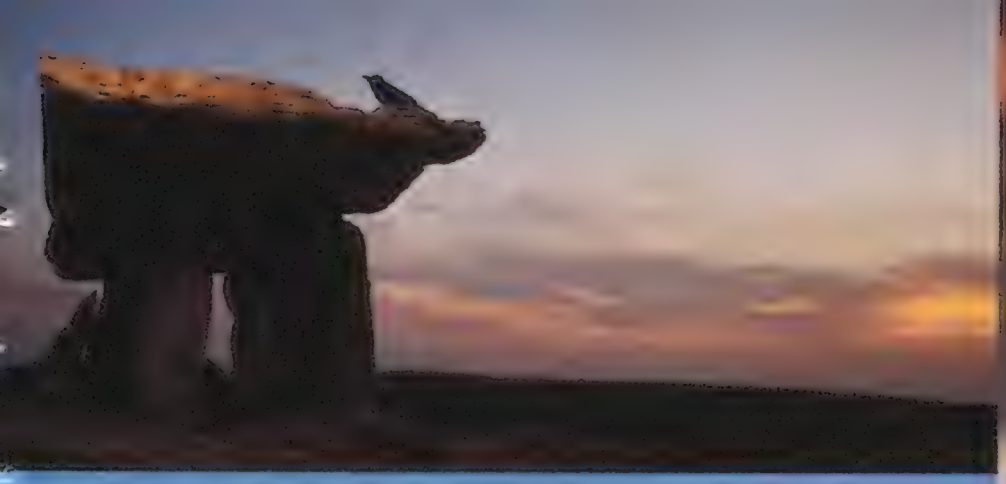

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Secretary Heyman's comments

Smithsonian Perspectives

As financial demands soar, the Institution seeks corporate dollars while safeguarding its integrity

This is a shortened version of a speech I made in December at the National Press Club. It involves the financial health of the Smithsonian—a subject of considerable importance.

Last year I received a letter that immediately got my attention. In it the Smithsonian was accused, in the critic's words, of "upping its ante with the devil."

What had driven my correspondent to exasperation was an announcement I had made soliciting corporate partners to fund an unprecedented initiative upon which the Smithsonian had embarked: the traveling exhibition, in celebration of our 150th year, of 300 of the greatest treasures we hold in trust for the American people.

"America's Smithsonian" required resources that I could not divert from our already strapped operating budget. Nor was I likely to find the required multimillions for such a short-term project by going to individual donors, however generous, or to foundations, subject as they are to so many worthy claims in these tough times for the arts.

So I approved a strategy that breaks new ground for most nonprofits: the inauguration of a corporate partnership program akin to that which provides support for the Olympics and similar events. Any time you break new ground, you expect controversy. Surprisingly, there was little. But those, like the correspondent, who did object raised important concerns that deserve attention.

Our disagreement is not about whether there are risks to an institution's integrity in accepting corporate sponsorship. Of course there are. Our disagreement is about whether those risks can be dealt with, and outweighed by benefits. I think they can.

In the past few years the very conditions under which we and our society operate have changed. For the Smithsonian, public funding is still available to support our core activities, but even the optimists among us know that we face a future of fewer public resources.

Where then to turn? Donations by individuals will always be crucial, but they are not enough to address our wide-ranging needs. Foundations can never redress the balance of shrinking funds for the nonprofit sector.

So we in the nonprofit world find ourselves turning to corporate support more and more. The Smithsonian took its first step into the new realities in the summer of 1991, when it revised an earlier policy banning the display of corporate logos at the Smithsonian in recognition of support for exhibitions and other programs. The decision was left up to Smithsonian directors. Some held the line, others, like the director of our National Museum of American History, saw the trade-off as one he was willing to make: "If I had to make the choice between not teaching and teaching with a logo," he told the press, "I would teach with a logo."

The heart of the debate has to do with assessing both what the corporate sponsor gains and what we in the nonprofit world gain. Let's not be coy about it. A logo is closer to advertising; otherwise why would corporations insist on having it prominently displayed? But is it endorsement? Is the Smithsonian saying this is a better product than another? Call me naive, but I think that's a stretch. The Smithsonian, by allowing a logo, is simply allowing a corporation the full measure of public goodwill for having funded that important exhibition or program.

But if that's a small price to pay to ensure the greater good of funding important work, where should we erect the wall? Clearly we build it on the protection of content. No amount of money, from any source, should be able to purchase the content of the Smithsonian's exhibitions and other programs.

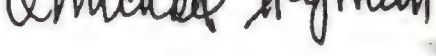
By now you have figured out that I am not one who believes that a connection with a corporate sponsor is a capitulation to all that is crass in our society. Indeed, I am amazed by the leap of argument that comes naturally to those who fear the worst. In the controversy that raged over the inclusion of LEGO-built animals in our exhibition in the late '80s on human attitudes toward animals—a choice made by our curators with absolutely no provision of corporate underwriting—we were warned that "Judging from the LEGO exhibit, it is only a matter of time before there are golden arches coming out of a McDonald's Air and Space Museum."

That's not my nightmare. Golden arches will not rise over the National Air and Space Museum on my watch. My nightmare is a future in which the Smithsonian is unable to make its collections and expertise easily available; one in which our ideas are stillborn, our capacity to update and contribute limited. But that's not to say I don't worry about what is and isn't acceptable in our commercial relationships.

If I had to summarize the Smithsonian's current thinking on the matter of corporate sponsorship, I would put it this way: we have entered an era of what I would call enlightened realism. We in the nonprofit world have certain needs that must be addressed and fundamental standards that must be adhered to. The corporate world has its own requirements. If we are to have mutually beneficial connections, we owe it to ourselves to work out what is and isn't negotiable and then to make every attempt to understand our potential partner's own issues.

But make no bones about it, this is an experiment. We have taken a number of actions to make sure we function within the bounds of propriety, including the scuttling of some borderline initiatives, the establishment of an internal panel to ensure the acceptability of all the partner programs, and the development of guidelines for the use of images and logos.

With these kinds of safeguards in place, we can guarantee the viability and integrity of the Institution.



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Letters to the Editor

Methyl bromide

I was disappointed to see in the December 1996 issue that Jeff Wheelwright bought into the argument that methyl bromide is an absolute necessity to the California and Florida economies. There is also the issue of public health and social justice. In Union City, California, for example, five public schools are located within a one-mile radius of ornamental flower fields fumigated with methyl bromide.

Agricultural users of the substance are not required by law to notify residents who may be affected by drift. Many workers who come into close contact with methyl bromide are not told what they're working with, nor are they always warned about its dangers.

It may take some extra effort to replace methyl bromide, and it may increase the cost of luxury crops such as strawberries, cut flowers and tobacco. The bottom line is that public health and environmental protection should not be sacrificed for profits.

Alba Morales
Political Ecology Group
San Francisco, California

Coney Island

I greatly enjoyed Bruce Watson's article on Coney Island. During my college days, a good way to finish a date was to stop at "Nathan's Famous" for hot dogs, clam chowder, barbecue and chow mein sandwiches.

One correction: the D train did not go to Coney Island until 1954.

Frederick Harrison
College Park, Maryland

Your article stated that Thomas Edison "offered to prove the power of his alternating current." Edison was a proponent of *direct* current and launched a hard campaign against Nikola Tesla, who touted alternating current. Edison electrocuted triple-murderer Topsy the elephant with alternating current to show the audience and the press how dangerous the high-voltage system was.

John G. DeRosa jr.
Stroudsburg, Pennsylvania

Scientific names

I chortled gleefully on reading Richard Conniff's article about the scientific names that taxonomists hang on unsuspecting creatures. As a protozoologist-parasitologist for more than 40 years, I have had great fun naming some species myself.

In my specialty of free-living (nonparasitic) amoebas I found one that regularly threw forward a pseudopod that looked like an elephant's trunk and then waved it about. I named it *Oscillosignum* (waving banner) *probiscideum* (elephant's trunk). Another amoeba in the same genus dived into debris and hid, so I called it *O. timideum.*

A friend of mine named an amoeba after me, calling it *Boveella obscura.* I still don't know whether he meant I was obscure or the amoeba was.

Eugene C. Bovee
Lawrence, Kansas

Phenomena, Comment and Notes

In his *Phenomena* column, James Trefil wrote about controlling the carbon dioxide content of the atmosphere by simply putting the right amount of iron into the ocean. At their February 1991 meeting on the "Geritol" solution to global warming, the American Society of Limnology and Oceanography passed a resolution advising all governments that the subject needed further research and urging them "not to consider iron fertilization as a policy option." Oceanographer John Martin was present and agreed that the resolution was appropriate.

We are decades away from sufficiently understanding ocean ecosystems enough to predict confidently all the biological ramifications of manipulating iron concentrations in seawater.

Lawrence R. Pomeroy
Athens, Georgia

STRI

In the article by John F. Ross on the Smithsonian Tropical Research Institute (STRI), he wrote that the opossum, the armadillo and the hedgehog survive as southern transplants in the north today. Is hedgehog correct?

Bill Smith
Sylmar, California

No, it is the porcupine. Ed.

Edward K. Thompson

I enjoyed the article about SMITHSONIAN's founding editor and publisher, Edward K. Thompson; however, the name of the cartoonist who was mentioned was misspelled. He is Jeff MacNelly.

Glen Billy
San Francisco, California

Book Reviews

Just from reading the review of L. S. Schwartz's book *Ruined by Reading: A Life in Books,* I feel an affinity for the author. I do have one small correction, however. The long-running advice column "Can This Marriage Be Saved?" is published in *Ladies' Home Journal* not *Good Housekeeping.*

Gene Ann Delapenia
Harlem, Georgia

The reviewer of William Lee Miller's *Arguing About Slavery: The Great Battle in the United States Congress* wrote that the "Second Amendment's right of petition may today be the least remembered of the Constitution's guaranteed freedoms." That amendment concerns the right of individuals to keep and bear arms. The right of petition is found in the First Amendment.

Ronald N. Walker
Cobb, Wisconsin

Mogollon (November 1996)

The two Classic Mimbres bowls pictured on page 70 of your November 1996 issue are from the Western New Mexico University Museum's Eisele Collection of Southwestern Artifacts.

Cynthia Ann Bettison, Director
Western New Mexico University Museum
Silver City, New Mexico

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Phenomena, Comment and Notes

By John P. Wiley jr.

As scientists probe deeper into whether animals really have consciousness, peripheral questions arise. If they think, do we really want to know what they think . . . about us?

For a good part of this century, while the behaviorists ruled, science gave animals little or no respect. They were thought to be automata or, as we would say today, "hardwired." Dogma had it that animals could not think, that they did not even have consciousness. Case closed.

In recent years, however, a few intrepid souls, inspired perhaps by Donald Griffin of Harvard University, have started to take another look. Papers that would have been sneered at a generation ago are being published in research journals. "The Problem of Animal Consciousness in Relation to Neuropsychology" is printed in *Behavioural Brain Research.* Science magazines are not far behind: "The Emotional Chicken" appears in *New Scientist.* And SMITHSONIAN ran an article in March 1985 that showed animals not simply acting consciously but apparently with Machiavellian intent.

All this is exciting, but it is not surprising to those members of the population who share their lives with what are now known as companion animals. There's no doubt in my mind, for example, that dogs not only have consciousness but also a sense of humor. It is very nice to see animals at last getting some respect from the cold hearts of science. But it also makes me nervous . . . very, very nervous.

At the moment a dog named Gizzie shares my life, not to mention my food and a substantial fraction of my bed. He seems content but who can say? My great fear is that we will not only concede that animals have consciousness, we will find ways to piece together at least a general idea of what they think.

It could be a rude awakening. My dog loves to go for long walks across pastures and into the woods (I think), but recently I've begun to worry about what he's thinking as we wend our way together. Suppose, just suppose, he sees a typical walk as something like the following. (Having no idea of how a dog might actually think, I've given him a mostly human vocabulary.)

Gizzie watches for the signals that a long-awaited walk is about to begin.

"They're so hard to deal with. Disappear upstairs for hours until in desperation I have to give my strangled-puppy yelp. He looks down the stairs and says 'Just a minute.' Yeah, sure. Finally he comes down and takes forever to put those heavy things on his feet and then layer after layer of pelt. It must be so tedious to be a two-foot.

"Outside I have to walk toward the back gate over and over to show him the way. He doesn't see the flier sitting on the fence, its feathers all puffed out against the cold, until it flies. Something wrong with his eyes. 'Bluebird,' he says. So what, I say. It's too hard to catch and too small to eat.

"The wind is coming from where the sun goes down. It is heavy with the smell of the oversized grass eaters. But the smell of fresh manure makes me feel warm. I run this way and that, getting the kinks out. He straggles. As we walk across the field I have to stop every 50 yards to make sure he is still coming.

"When we come to the creek, I just walk across. What else? He stops, sticks out a foot, makes a big deal of stepping from rock to rock, finally gives a little jump to the other side. Why is he so afraid of water?

"Then the ground starts going up toward the sky. Big deal. I just keep walking. He comes up on an angle so he has to walk twice as far to get to the top. He is breathing hard like he has been running, but he has barely been moving. I'm feeling so good I can hardly keep my feet on the ground. So I race along the side of the hill, back and forth, in sheer exuberance. He finally makes it to the top, to the end of the pasture, to a fencerow that has come straight up the hill. Now I'm getting good smells, fresh ones. In and out of the bushes. Mice. Foxes. Weasels. Dogs trying to mark my territory.

"Across the top of the hill. On one side of us now are the trees that always stay green. I can smell the leaping wild ones. They're here; I know they're here. Sometimes I find places full of their scent where the grass is all mashed down: the places where they sleep.

"We're alongside the naked trees now, walking easily where eight-foot-high flowers made it tough in the summer. He always crosses the barbed wire at the same place, where a rotting log makes it easier for him to step over. Being vertical must be a drag. I can walk under the fence in a hundred places.

"As we make our way through the

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bushes on the other side of the fence, we emerge into another pasture. He follows a grass-eater trail that descends the hill on an angle, moving slowly down. I go straight down (the slope isn't that steep!) and get to the bottom in one-fourth of the distance. Here there's a truly tiny stream, and yet he looks for a shallow place to cross.

"Red alert! A hot scent fills my being and I'm off, running effortlessly with my nose only inches from the ground. I start the wrong way and feel the scent cooling. Reverse direction, and the scent gets warmer and warmer . . . and then ends in that same little stream.

"Across this pasture we come to the big stream and the pond below the dam. He always stops here and looks around, but I know there is nothing of any interest because we have walked into the wind and I would have smelled it. To go upstream we have to climb over a stone wall that extends out from the dam. I walk up and jump down on the other side and start to walk. Oops, no two-foot. I look back and there's Old Clumsy, carefully putting one foot on a rock in the wall, then another foot on another rock. The wall only comes up to his shoulders, but he acts like he'd be killed if he slipped. Finally he's on top and drops down to the other side, which is only a little jump.

Dog and human cross a shallow stream. For Gizzie, it's a simple matter of walking across. For the author, it's an awkward dance to avoid wet feet.

"It's so much easier now than it was in the summer. But still the long skinny green stems catch in his outer pelt (fur is so much easier); sometimes he actually cuts a path. Across the stream a flier is making a sound just like a two-foot laughing.

"We're both alert now, because we're coming to where the underwater animals live. A furry face silently pops up out of the water; the animal swims slowly to no place in particular, dragging that flat, hairless tail behind it. Then it makes a loud slapping sound and rolls under the water. A few minutes later it is up again, swimming just as slowly. Old Clumsy always looks at me to see what I'm going to do. I watch it for a while, and then look away and pretend it's not there. He surely can't expect me to retrieve something as big as that, especially while it's still alive.

"The sun is beginning to feel warm now. Clumsy is taking the extra pelt off the top of his head.

"We get to where the ground is collapsing and there are lots of dens, some of them almost big enough for me to walk into. But most of them have no fresh scent, so I move on. Clumsy never checks them. Across the stream a flier is hitting its head against a tree.

"I climb down the bank and swim across to the other side. Another hot scent: I'm off, nose to ground, coursing back and forth up the hill through the trees. But up on top I lose the scent, come back, swim back across and have a good roll. He watches.

"Ever so slowly, we walk farther up the stream, past the place where last summer the underwater animals had built a dam clear across a shallow part of the stream. It's not there now. Ice hangs down from the roots of trees that have blown over. In one place the stream pushes us into a grass road that smells of gasoline and oil; this is where the two-feet play on their noisy carts that are too small for them. We go about a mile and then come to where wire stretches across our path. There are only a couple of strands, and I go under them like they're not there and try to lure him farther up the stream. But Clumsy always turns around here. There's so much more stream to explore . . . I really don't get it.

"On the way back I try to lure him into going in another direction, but nothing doing. He just kind of slogs along. I hear one flier singing and another singing the same song right back at him. Another one flies down the stream, making a rattling sound. The big fliers that swam where the underwater animals do and honked at us all the time are gone. The big dark ones that just glide around all day are in the sky, though.

"Climbing back up the hill to where the log is under the wire fence, I hit pay dirt. A hot den entrance. I dig my fastest, but it's tough going, with all the roots and rocks. I keep pushing my head in the hole and sure enough, the scent gets hotter and hotter. But the digging gets tougher and tougher, and so I break off.

"Under and over the fence, through the naked trees and past the green ones, and then down the hill again. Clumsy takes his same path; I gallop up the ridge just for fun. I time it just right so when he gets to the creek I come racing out of nowhere and cross just in front of him. It takes him just as long to get back over. Through the gate and back to the house. We both head for the kitchen: it's time for a biscuit. Then I climb up on the couch for a quick nap, while he touches the magic box and sits down to watch the flickering images."

Now I'll cheerfully stipulate that Gizzie is faster, has a better sense of smell and seems immune to cold. I'll certainly bow to his night vision, which allows him to run across pastures on moonless nights while I stumble along. But does he really think of me as Old Clumsy? If I could find out, would I really want to know? The sensible thing, perhaps, is to let sleeping dogs lie.

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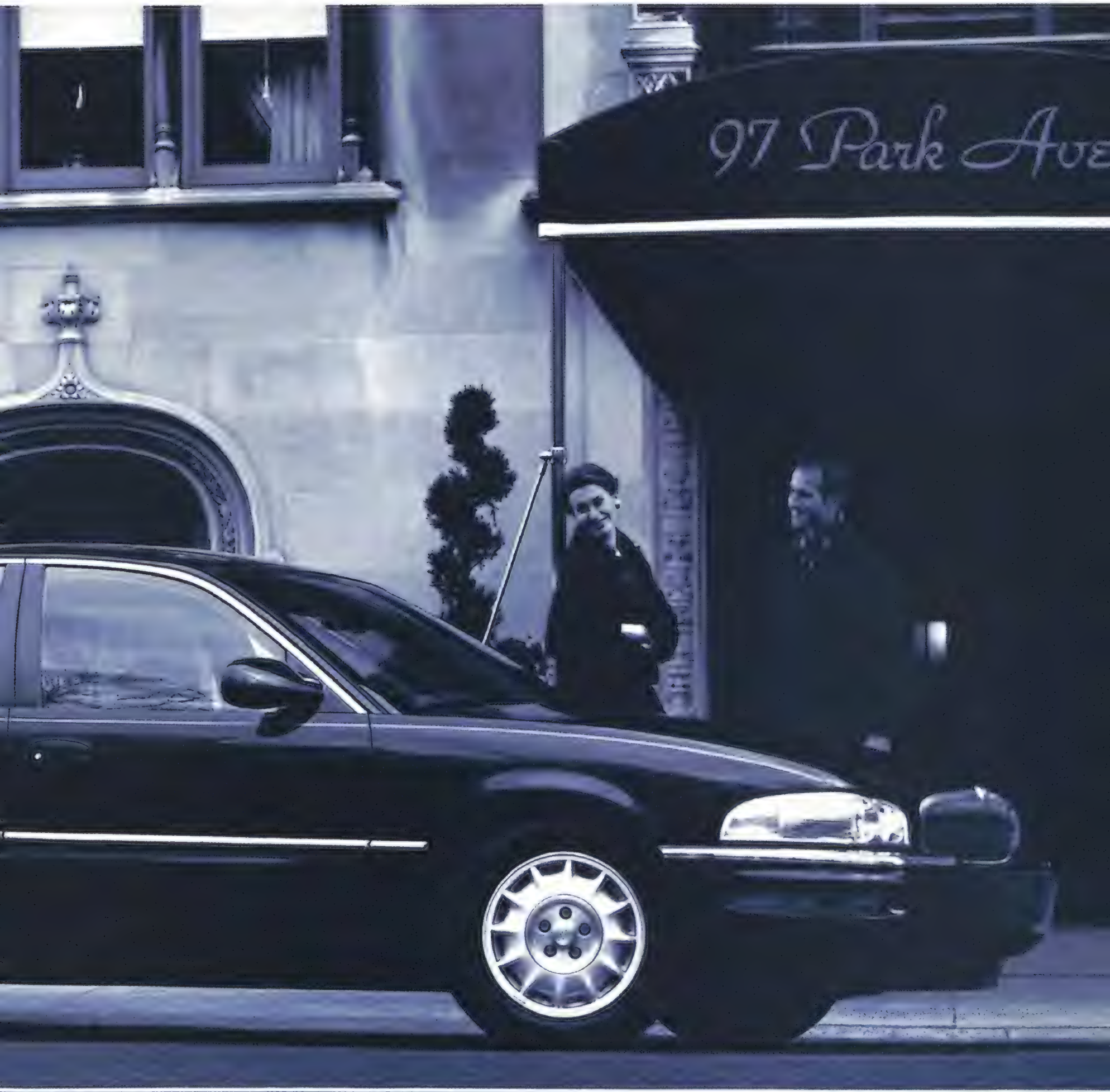

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Smithsonian Highlights

Planning a Smithsonian visit?

Receive a free Associates' planning packet. Write Smithsonian Information, Smithsonian Institution, Washington, D.C. 20560, or call 202-357-2700 (voice) or 202-357-1729 (TTY), 9 A.M. - 5 P.M., Monday-Friday; 10 A.M. - 4 P.M., Saturday-Sunday. Note: Parking near the Smithsonian is limited. The Metrorail subway system, convenient to all museums, has parking available at some stations (details in packet).

Begin your visit at the Smithsonian Information Center's Associates' Reception Desk—open 9 A.M. - 4 P.M. daily—in the Castle. Special materials await you there. The Court dining room in the National Museum of Natural History is permanently closed. Associates may now avail themselves of a discount on table service at the National Air and Space Museum's Wright Place restaurant, open 11:30 A.M. - 3 P.M. daily.

Museum Hours

Smithsonian museums are generally open 10 A.M. - 5:30 P.M. daily, except December 25. Hours at the National Zoo are 9 A.M. - 4:30 P.M. daily for buildings, and 8 A.M. - 6 P.M. for grounds.

Smithsonian Website

The Smithsonian home page on the World Wide Web (http://www.si.edu) offers on-line information about exhibitions, collections, events and products.

Black History Month

The Smithsonian will be celebrating Black History Month in February with a variety of programs, activities and related exhibitions. For a 24-hour recording about these programs, call 202-357-4574, beginning February 1.

Smithsonian Musical Weekend

The 25th annual Smithsonian Musical Weekend will be held April 25-27. Highlights of this anniversary year will include gala receptions and dinners at the Museum of Natural History and the National Portrait Gallery, concerts and demonstrations using the Smithsonian Collection of Musical Instruments, and a performance of *The King and I* at the Kennedy Center. Call (202) 973-2150, or write Friends of Music, P.O. Box 14445, Washington, D.C. 20044, before March 15.

A stamp depicting a pair of king eiders is on display in "Artistic License: The Duck Stamp Story" at the Smithsonian's National Postal Museum.

Special February Exhibitions, Events

Arts and Industries Building

Feeling the Spirit: Searching the World for the People of Africa and *Invoking the Spirit: Worship Traditions in the African World* (through March 23) The work of *New York Times* photographer Chester Higgins jr. See *Highlights Continued*, page 26.

The Black Trans-Atlantic Experience (through March 23) Images by photographer Stephen Marc.

Stories of the People (through August 10) Artifacts from the National Museum of the American Indian.

The Spring Flower Show (through March 8) Exhibition of flowering bulbs, trees and shrubs presented by the Smithsonian Horticulture Services Division.

Discovery Theater

Live theater for young audiences. For information, call (202) 357-1500 (voice or TTY) weekdays, 10 A.M. - 4 P.M.

National Air and Space Museum

Star Wars (through March 30) Display features costumes and character models from the movie and production paintings by Lucasfilm, Ltd. artist Ralph McQuarrie.

How Things Fly New permanent exhibition elucidates the basic principles of flight, aerodynamics and propulsion.

The Enola Gay (runs indefinitely) Exhibition features the forward fuselage of the *Enola Gay*, the B-29 that dropped the atomic bomb on Hiroshima.

National Museum of Natural History

Feather Focus: The History of Feather Research (through June 29) Display celebrates the work of world-famous feather detective Roxie Laybourne.

HoloGlobe (through August) First public showing of large-scale High-Definition Volumetric Display (HDVD) gives viewers a unique look at our planet.

Gems and Minerals Hall Gallery is closed for renovation until late 1997. The famous Hope Diamond is on view on the second floor of the Rotunda.

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Veterinarians Recommend Purina Fit & Trim.

National Zoological Park
Amazonia Science Gallery New permanent exhibition looks at the work of Smithsonian biologists worldwide.

National Museum of American History
Hallowed Ground (through mid-February) Photographs explore the cultural landscape of Virginia's northern Piedmont region.
From a Friend in America: 50 Years of CARE (runs indefinitely) Display traces the history of CARE, the Cooperative for American Remittance to Europe.
Sitting for Justice Permanent exhibition featuring a section of the historic Greensboro, North Carolina, Woolworth's counter documents the February 1960 sit-in that challenged segregated eating places.

National Postal Museum (Located next to Union Station on Capitol Hill)
Artistic License: The Duck Stamp Story Permanent display explores the role of Federal Duck Stamps (issued annually since 1934 to produce revenue) in preserving waterfowl habitats.
What's in the Mail for You! New permanent exhibition offers an innovative look at the direct mail industry.

Freer Gallery of Art
Chinese Gardens in the Painter's Imagination (opens February 1) Paintings from the 12th to the 19th century depict real and imaginary gardens.
Armenian Gospels (through May 1) Illustrations from medieval Armenian illuminated gospels.
Islamic Art (through May 1)Works on paper from the 9th to the 15th century.

Arthur M. Sackler Gallery
Art of the Persian Courts (through April 6) Works reveal the spread and influence of Persian culture across the Islamic world from the 14th to the 19th century.
Preserving Ancient Statues from Jordan (through April 6) Exhibition features ancient plaster statues (c. 7000 B.C.) from an ongoing excavation in Jordan.

National Museum of African Art
Memory: Luba Art and the Making of History (through February 23) Art from the Luba Kingdom of central Africa.
A King and His Cloth: Asantehene Agyeman Prempeh I (through March 23) Exhibition examines and interprets an "Adinkra" cloth once owned by Asantehene Agyeman Prempeh I, king of the Asante nation in Ghana from 1888 to 1896.

Hirshhorn Museum & Sculpture Garden
Jeff Wall (February 20 - May 11) Retrospective features the work of contemporary Canadian artist Jeff Wall.
The Collection in Context: Paul Gauguin (through May 7) Installation explores the context and creation of the artist's *Cylinder Decorated with the Figure of Hina and Two Attendants* (1891-93).

National Portrait Gallery
Red, Hot & Blue: A Salute to American Musicals (through July 6) Exhibition organized jointly with the National Museum of American History spotlights the major personalities who created the American musical theater.
Breaking Racial Barriers: African Americans in the Harmon Foundation Collection (through September 14) Portraits from the 1950s show "Portraits of Outstanding Americans of Negro Origin."

National Museum of American Art
American Photographs: The First Century (through April 20) Show features daguerreotypes, ambrotypes, tintypes, from the museum's Charles Isaacs Collection of early American photography.
Folk Art Across America (runs indefinitely) Installation drawn from the museum's permanent collection recognizes the creativity of self-taught artists.

Renwick Gallery
American Crafts: The Nation's Collection (runs indefinitely) Works from the permanent collection by nationally prominent artists in a variety of craft media.

Seymour D. Earth guides kids through SITES' exhibition "Earth 2U, Exploring Geography," on view in Logan, Kansas.

The Castle—Information Center
Smithson's Gift Permanent display tells the story of the British scientist whose bequest founded the Smithsonian.

Anacostia Museum
Museum Renovation The museum will be closed for about nine months.

Heye Center, National Museum of the American Indian (New York City)
All Roads Are Good: Native Voices on Life and Culture (through February 1, 1998) Inaugural exhibition features objects that illustrate the diversity and continuity of Native cultures.

Cooper-Hewitt, National Design Museum (New York City)
Disegno: Italian Renaissance Designs for the Decorative Arts (February 11 - May 18) Drawings, prints and decorative objects from 16th-century Italy examine Renaissance concepts of design, creativity.

Exhibition catalogs

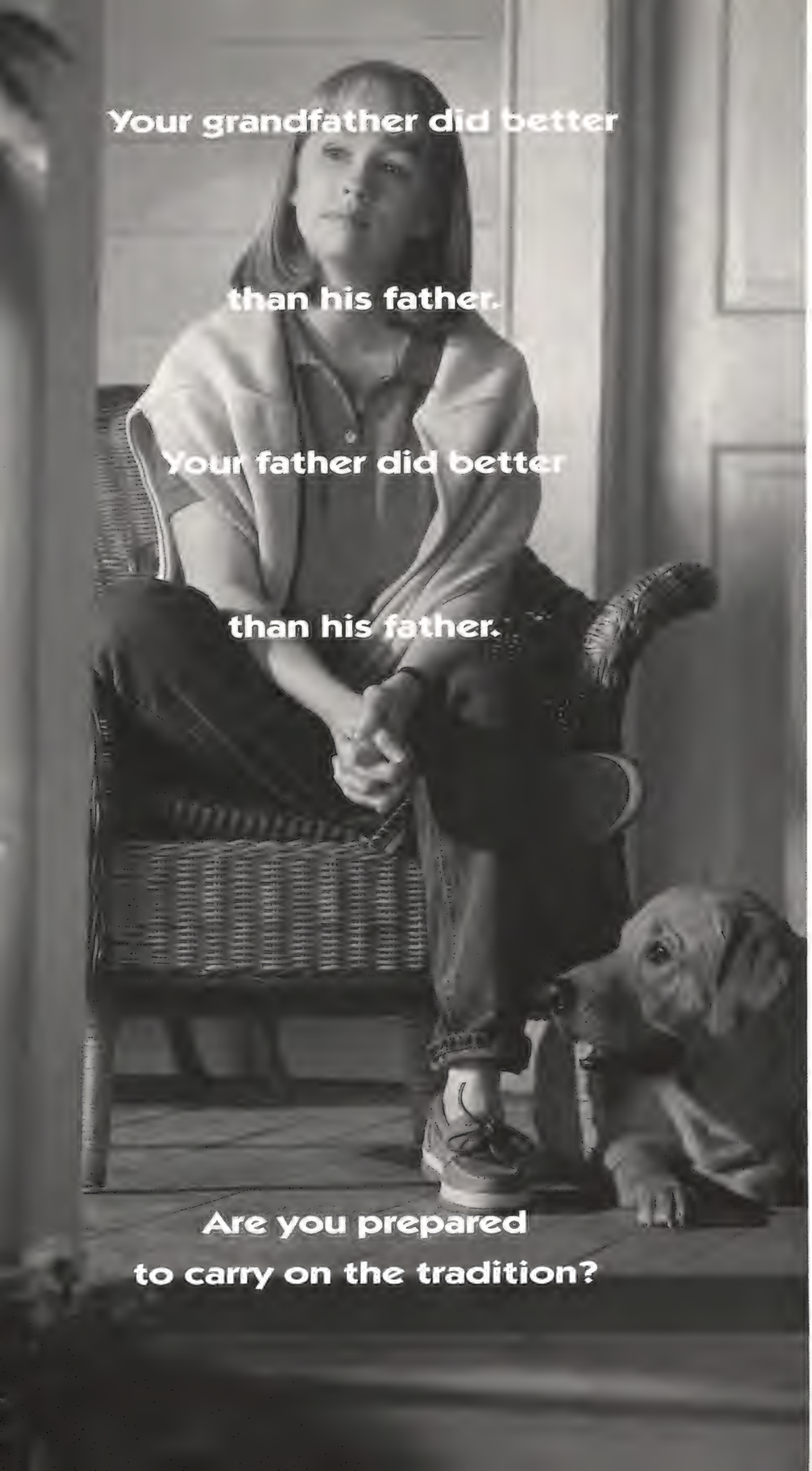
Catalogs available currently include:
24 Hours in Cyberspace ($49.95 cloth)
Hallowed Ground: Preserving America's Heritage ($40 cloth)
Jeff Wall ($35 paper)
Memory: Luba Art and the Making of History ($75 cloth)
To order, send check or money order to Smithsonian Museum Shops, P.O. Box 1140, Newington, Virginia 22122. Include 15 percent of purchase to cover postage, handling (minimum, $4.50).

Smithsonian on the Air

Folk Masters Join host Nick Spitzer and masters of traditional American music in a Radio Smithsonian presentation of blues, gospel and Creole cabaret. Check local public radio listings.

Smithsonian Institution Traveling Exhibition Service

SITES organizes and circulates exhibitions to cities throughout the United States and abroad. To sponsor a show in your community, write SITES, Smithsonian, Washington, D.C. 20560. Here are some February exhibits:
• Logan, Kansas (February 8-June 1) *Earth 2U, Exploring Geography,* Dane G. Hansen Memorial Museum.
• Miami, Florida (February 22-April 20) *Wade in the Water: African American Sacred Music Traditions,* Miami-Dade Public Library.



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Highlights Continued

Picturing the face of the African diaspora

"We are Africans not because we are born in Africa," says *New York Times* photographer Chester Higgins jr., "but because Africa is born in us." For the past 30 years, Higgins has traveled the globe documenting the traditions, spirituality and dignity of people of African heritage. He has lived among and photographed Dogon dancers in Mali, Vodou practitioners in Haiti, Black Hebrews in Harlem and Yoruba worshipers in Brazil. Now some 270 of these images can be seen in two exhibitions sponsored by the Smithsonian's Center for African American History and Culture. "Feeling the Spirit: Searching the World for the People of Africa" and "Invoking the Spirit: Worship Traditions in the African World" are on view through March 23 in the South Gallery of the Arts and Industries Building. "It's the people's characters themselves speaking through the film, through the lens, that tells the story," says Higgins. From the Sahel region of Senegal to the streets of Harlem, Higgins creates a compelling chronicle of the life and times of men and women of African descent.
Diane M. Bolz

Higgins' artful image of a poleman relaxing on a trip across the Niger River in Mali (above) and his dramatic portrait of a Muslim woman in Brooklyn (top) capture the vitality and diversity of the African experience.

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LINCOLN

What A Luxury Car Should Be

By David Helvarg

When Uncle Sam's 'fish cops' reel in a suspect, he's usually a keeper

At a dockside inspection in Bellingham, Washington, NMFS officer Pat Guilfoil monitors weighing of halibut.

Agents of the National Marine Fisheries Service often work undercover gathering the evidence needed to make arrests stick

Welcome to the bridge of the *Gauntlett,* a 46-foot patrol boat owned by the state of Washington's Department of Fish and Wildlife. Meet Pete Chorney, an agent of the National Marine Fisheries Service (NMFS); Craig Carlile, a state wildlife officer; and David James, an enforcement officer from the Lummi Indian reservation. We're churning across Boundary Bay a few miles off Birch Point at the northernmost reach of the Washington coast. My companions are on a routine patrol about a quarter-mile south of 49 degrees 10 seconds north latitude, the invisible line in the water that separates the United States from Canada, when they spot three fishing boats they suspect of crab poaching. Suddenly, the boats scatter. "They're taking off!" Chorney hollers. Now, with Carlile at the wheel, we are pursuing the closest one, a skiff with two men aboard. "This is a typical day out here," Chorney tells me, half shouting to make himself heard.

The fleeing skiff, powered by two big outboard engines, throws up a huge rooster tail as it heads for the safety of Canadian waters. After crossing the line, Carlile powers down and turns the *Gauntlett* around. Back on the American side, we begin pulling up pirate pots. The second one holds a surprise, a small plastic Canadian crabbing license attached to its frame. "Pure stupidity," Chorney says as he removes several sandy-colored crabs and tosses them over the side. "We'll file a report with Canada under our joint-enforcement agreement, but the owners will probably claim their pots were stolen or lost."

"What would you have done if you'd caught them?" I ask. "We would have seized their boat and put them in jail," says Carlile.

Knowing the NMFS means business makes poachers uncooperative. Several years ago the *Gauntlett,* with another state officer and NMFS agent Andy Cohen aboard, successfully chased down another suspicious crab boat. "I stepped on and moved to turn off their engine," recalls Cohen, a dark-haired father of two. "That's when one of them grabbed a meat cleaver off the transom. I pulled out my revolver from my shoulder holster, backing up against the wheel. He moved forward, lifting the cleaver over his head. The state officer had his gun aimed from the other heaving boat, and I remember thinking, 'If he fires, it could hit any of us.' Then, the guy with the cleaver decided to drop it."

Chorney and Cohen are two of 112 federal "fish cops" who enforce the laws that protect our threatened fisheries and endangered marine mammals. These include the Magnuson Act, which bans foreign fishing fleets from United States waters and authorizes regional fisheries-management councils; the Marine Mammal Protection Act; the Endangered Species Act; and the Lacey Act, which, among other things, outlaws transporting illegal marine products across state or international bor-

Photographs by Richard Schultz

A suspect is taken away in handcuffs after a raid on contaminated mudflats in Massachusetts by NMFS and state officers. Seven people were apprehended for digging clams and allegedly selling them to eateries.

ders. NMFS agents are also responsible for making sure shrimpers install devices that prevent sea turtles from drowning in their nets in the Atlantic and the Gulf of Mexico, dealing with New Englanders who are frustrated over the collapse of the Georges Bank fishery and mediating conflicts over salmon in the Pacific Northwest. As part of their endangered-species work, they patrol (often on horseback) 900 miles of the Columbia River basin where salmon are threatened by dams, clear-cutting and cattle grazing.

It's dangerous work. NMFS agents worry about being outnumbered or outgunned by angry ranchers and anti-government militias, or ambushed by wary poachers. Dave Johnson, a white-bearded veteran who looks like an old cowboy, has been shot at three times while pulling illegal gill nets out of rivers. Rich Severtson, a kind of seafood Serpico who runs undercover operations out of NMFS's Seattle office, was pulling a gill net on the Columbia River with an Oregon trooper a few years ago when someone fired five rounds at them with a high-powered rifle. "After the firing stopped we couldn't find anyone," Severtson says.

Tom Shuler is presently in charge of NMFS's Northwest region, but through the years he has been involved in some pretty scary situations all over the country. An ex-professional football player, Shuler weighs 300 pounds and stands 6 feet 6 inches tall. His bulk has come in handy more than once.

His strength certainly helped during his years in Alaska, when he had to tunnel through huge blocks of frozen fish in the hulls of foreign factory trawlers, checking for prohibited species. It didn't hurt when he was winching up 1,000-pound crab pots in closed areas of the Bering Sea during winter gales, when seas were running 10 to 12 feet. It was definitely an asset when he was coiling ropes, throwing grappling hooks and tossing 15-pound king crabs around on the icy deck of a 96-foot Alaskan enforcement boat.

When Shuler was working in NMFS's Southeastern region, he and other agents created a network of informants who helped break up a number of poaching rings that were illegally taking bluefin tuna, red snapper and

David Helvarg is a TV producer and the author of The War Against the Greens, *a chronicle of the environmental backlash. He lives in California.*

red drum. The three species were being overfished to the point where their survival was threatened. "Japanese buyers on the docks in Venice, Louisiana, would bid as much as $55 a pound for bluefin," Shuler explains. "The fish would be flown out that day and be sushi in Tokyo the next day. Some of these tuna can weigh more than a thousand pounds apiece, so you could be talking tens of thousands of dollars for just one fish. Because of this, fishermen were taking more than the law allowed. Sometimes they'd tie up to an oil rig or a buoy in the Gulf of Mexico and transfer the illegal fish to another boat, which would claim it had caught them."

Once, responding to an informant's tip, Shuler and a state agent spent most of a night fogbound in a small open boat near an oil rig at the mouth of the Mississippi River. They could hear big fish being transferred from one boat to another but couldn't see anything. They had to wait until morning to move in and make their bust, seizing two fish worth more than $70,000.

Following another tip, Shuler was able to track down several trucks carrying illegal shipments of red drum from Louisiana to Mississippi. When they rendezvoused at a farm with another truck that was supposed to take the contraband to a processor in Texas, Shuler showed up. Pretending to be an itinerant laborer, he convinced the drivers to hire him as "muscle." As he transferred the heavy crates of fish, he marked them with Xs, clipped some fish tails as evidence and sprayed invisible dyes on the cargo that would show up under black light. When warrants were later served in Texas, the hands, arms and aprons of the workers on the processing line glowed scarlet-blue under examination. More than a dozen people were indicted; the ringleader was sentenced to a year in jail and fined $50,000.

NMFS agents gather periodically off New England, the West Coast and Hawaii to protect whales during their seasonal migrations. Using fast boats, spotting scopes and tourist disguises, they monitor commercial and recreational whale watchers to make sure they don't harass the leviathans. They once caught a windsurfer off Maui who was using a whale's back as a launching ramp to do aerial tricks. In another case now being reviewed for possible prosecution, a seaplane landed on Puget Sound and chased a killer whale for a half-hour.

NMFS is understaffed and little known outside of its parent agency, the National Oceanic and Atmospheric Administration in the Department of Commerce. Fish cops are criticized for not doing enough by their allies in the environmental movement and pressured to do less by the industries they monitor. The work is often tedious and exacting.

Lisa Querin's beat includes the salmon boats and groundfish trawlers that operate out of the scenic coastal town of Bodega Bay, in Northern California. This is where Alfred Hitchcock filmed *The Birds*, and the noisy gulls on the roofline of the Eureka Fisheries warehouse do their best to keep up appearances. Querin is responsible for enforcing an ever-expanding list of federal fishery rules and regulations on size limits, pounds per trip, type of gear and closed seasons. Today she is watching a trawler pump thousands of pounds of black cod, thornyheads, Dover sole, and various species of rockfish into large plastic crates. As the crates are forklifted onto a scale, she makes sure the figures being recorded by Eureka's "weigh master" reflect both what the scale is showing and what the law allows.

Down on the Bodega Bay municipal pier, second-generation fisherman Andy Phillips is overseeing his two crew members as they fix the net on his trawler, the *Jo Ellen*. A big man with a gray beard, Phillips has a swagger from 35 years on the ocean and a voice as rough as

NMFS agent Pete Chorney looks for identification on a Canadian crab pot discovered in American waters.

gravel. "I've gotten a couple of tickets from this gal," he says, referring to Querin, "but I got no beef. I was over the limit. The real problem is, the regulations aren't doing the job. Back around 1986, you'd just head out and when the boat was full of fish the trip was over."

"But you agree the fishing's gotten worse?" I ask him.

"Of course the fishing's worse," he replies. "We killed them all. Places where I used to get 20,000 pounds, I get 100 pounds now. 'Decimated' is the word."

Does Phillips see any hope? "Just stop fishing for about 20 years and the fish'll come back—but that's not practical. I couldn't do any other kind of work myself."

Zeke Grader is the executive director of the Pacific Coast Federation of Fishermen's Associations, a group that represents commercial fishermen in California, Oregon and Washington. "Our catching capacity far exceeds our knowledge of the fish," he says. "We have to protect habitat and endangered species to protect the resource. The biggest problem I see with these enforcement people is there aren't enough of them."

The problem is not just overfishing. Pollution has caused many of America's shellfish beds to be closed to commercial use, but the closures are often violated. That's why I'm sitting in a surveillance vehicle in a restaurant parking lot outside Portsmouth, New Hampshire. Next to me is Frank Italia who, with his lanky frame, jeans and worn green shirt, looks more like a grunge rocker than a federal agent. Behind us Bob Stone, the agent in charge of special operations for NMFS's Northeast region, is adjusting an array of video cameras and microphones. Stone used to work as an investigator for the Florida state gambling commission. "I traded horses and dogs for fishes and whales," he tells me.

Across the lot, a shady-looking seafood buyer is leaning against his Chevy Blazer, waiting for his contact to show up. After an hour and a half, a gray station wagon pulls up and a neatly dressed woman gets out. In our vehicle, thanks to NMFS's surveillance gear, we can hear their conversation.

"He couldn't come," she says. "He's digging now."

"He was giving me eight altogether," the buyer says as he inspects the two 50-pound sacks of clams in her car. "So he'll give me the other six this evening?"

"I don't know," she says. "I got these and left."

The buyer transfers the wet bags onto the tailgate of his vehicle. "He must have just dug these. Looks pretty good," he says, tilting his cap back. Suddenly, three green vans glide into the lot. Before the suspects can react, a team of New Hampshire and Massachusetts law enforcement officers have them up against their cars and are handcuffing them. The buyer is complaining that the cuffs are too tight as he's put in a police van. We can still hear everything he says because there's a microphone hidden on his body. The "buyer" is really Chris Schoppmeyer, a NMFS agent who has been working undercover on this case, which involves a conspiracy to sell polluted clams, for three months. That night the woman's source will be arrested as he leaves the mud-

flats off Revere, Massachusetts, just north of Boston.

The following morning, I accompany a joint task force of 27 state and federal officers as they sweep the flats below a landing approach to Boston's Logan Airport, where poisonous industrial wastes mix with sewage and landfill overflows. They arrest seven mostly older clammers, confiscating their shellfish and several vehicles. Criminal summons will be served on some 25 other diggers. Although fishermen are allowed to dig a small number of clams for use as bait, this crew allegedly has been selling some 18,000 pounds a week for human consumption to stores and restaurants in northern Massachusetts and southern New Hampshire.

Clams absorb sewage, heavy metals and other toxins in the water. If they are dug up from polluted areas like this one, they can spread hepatitis, cholera and salmonella. The legally allowed fecal coliform count for edible clams is 230 parts per 100 grams. These clams test around 20,000 parts per 100. The day after the bust, Massachusetts responds by announcing that it will no longer allow "bait clamming" in its polluted shellfish flats.

Sometimes NMFS scores a major environmental victory, as it did a few years ago with a series of stings that helped bring about an international ban on high-seas drift nets. The nets, made of fine nylon mesh, stretch 30 to 40 miles in length and reach from the ocean's surface to a depth of 35 feet. Any bird, fish or mammal that becomes entangled in them is doomed.

During the 1980s, around 1,000 boats from Japan, Korea and Taiwan operated a drift-net fishery in the north Pacific. They claimed they were fishing for squid, but early in 1987 a NMFS agent inspecting a cold-storage facility in Bellingham, Washington, found 45,000 pounds of illegal salmon with strange slash markings on their skins. They belonged to a fish trading company outside San Francisco. The investigation led to the seizure of half a million pounds of drift-net-marked salmon that had been shipped through certain Asian ports to San Francisco. The fish were trucked from there to Bellingham, relabeled as products of the United States and shipped to Japan, where sales of drift-net-caught salmon were illegal, but American salmon fetched a high price. Variations on this international smuggling scheme, using transit ports in Asia and Latin America, became known as the salmon laundry.

NMFS agents were soon involved in a series of undercover buys from the laundry. In one video taken by a hidden NMFS camera, a Seattle smuggler and his Japanese partner are shown offering two undercover agents 12 tons of salmon caught in Taiwanese drift nets. The haul is worth $46 million wholesale. The American was later arrested and sentenced to six months in jail; his partner put up $150,000 in cash for bail and fled to Japan.

Agents then negotiated directly with a Taiwanese salmon smuggler for an at-sea delivery of 1,000 tons of hot fish from one of the drift-net pirate fleets. The undercover operatives agreed to pay the smuggler $1.3 million. NMFS rented a large transport ship, the *Redfin*,

Three faces of the NMFS (from left to right): Bob Stone watches a sting operation from surveillance vehicle; officers log in a scrimshawed whale's tooth that was confiscated in a raid; Lisa Querin checks a boat captain's documentation.

Native American fisherman shows a salmon he took legally out of the Columbia River to NMFS agent Dave Johnson, who's usually accompanied on his salmon-fishing patrols by officers from the Intertribal Fishery.

from a local fish company, and that summer it sailed out of Dutch Harbor in the Aleutians with undercover agents Dave Johnson and Andy Cohen onboard. After two weeks at sea, the *Redfin* met up with several Taiwanese pirate ships full of salmon. Just as two of the Taiwanese captains were coming aboard, the *Morgenthau,* a Coast Guard cutter that had been lying in wait just over the horizon, came surging into view, its klaxon sounding. Then a pair of big Coast Guard patrol planes came roaring out of the clouds, dropping smoke bombs around the startled pirates.

The Taiwanese vessels made a run for it. As the *Morgenthau* and the *Redfin* gave chase, one pirate crew threw netting over the side to try to foul their propellers. When that failed, the pirates rammed the *Redfin* amidships. "It was like a Wild West chase on the high seas," one of the *Redfin*'s crew later recalled. At almost that same moment in Seattle, the head man and a cohort were being placed under arrest as they left a bank carrying $330,000 of Uncle Sam's cash. The smuggler was later sentenced to five years in prison.

Agents on the *Morgenthau* were eventually allowed to board one of the pirate ships just off the coast of Taiwan. They found 110 metric tons of illegal salmon in its hold. Environmental groups had been complaining for years about the destruction of the Pacific ecosystem by drift nets. The NMFS exposé of the salmon laundry lent crucial support to the campaign by the United States, New Zealand and other Pacific nations for a United Nations moratorium on large-scale drift nets—a ban that went into effect four years ago.

In recent years, NMFS has made good use of technological advances. Foreign fishing vessels that have been caught violating America's offshore territorial limits can now be required, as part of their penalty, to carry satellite transponders that allow NMFS to track their movements. Another device, called Forward Looking Infrared Radar (FLIR), has played a crucial role in policing salmon poachers on the lower Columbia. Mounted on a small plane, FLIR is so sensitive "it can read the heat signature of a guy who's turned off his boat engine and pulled into a cove to hide," Dave Johnson explains. "It can even see the float lines of his nets."

Gadgets are useful but they're no substitute for people. The NMFS doesn't have nearly enough fish cops to keep up with its growing responsibilities. As a result, agents often have to work alone in unmarked vehicles and with little prospect of immediate backup if they get into trouble. Agent Kevin Flanagan was working with Pete Chorney in New Bedford, Massachusetts, not long ago when they spotted a boat unloading undersized scallops at 1 o'clock in the morning. As they ap-

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proached the dock, they were confronted by a dozen angry crewmen. Flanagan and Chorney ordered the captain to take charge of his crew, which he did, but not before four of the men trashed the agents' vehicle, smashing its windows and slashing its tires.

Now we're in the necropsy room of the Marine Mammal Center, a private research, rescue and educational facility located just north of the Golden Gate Bridge in California. Three people have just rolled the body of a 215-pound sea lion onto the metal dissection table. The animal was brought in alive two days ago after it was discovered suffering from a suspected gunshot wound on an isolated beach. It died within a matter of hours. Veterinarian Frances Gulland performs the necropsy, using a scalpel to trace a bullet's track through the animal's neck and body until she finds and extracts a slug.

NMFS agent Joe Koczur, who is based in San Francisco, rolls the small, copper-colored object in the palm of his hand. Under the Marine Mammal Protection Act, killing a sea lion can be a criminal offense. Koczur has worked on fisheries enforcement from Guam to Alaska. "We might be able to match this slug if we could get hold of the firearm," he says. "But we just don't have enough information in this case to set up the right kind of surveillance operation."

Four years ago, the NMFS did set up the right kind of surveillance operation after a number of dead sea lions were found in Monterey, California. "We learned where the killing was taking place," agent Dan Torquemada tells me, "so we were on the scene with spotting scopes and binoculars when the shooting began one night around 2 A.M. It continued until daylight. We were able to focus on this one squid boat about 300 yards out. It was all lit up so that we could actually see the guy who was doing the shooting." The man was prosecuted and fined $40,000.

Roy Torres, the NMFS agent presently stationed in Pacific Grove, California, is responsible for covering 100,000 square miles of ocean and coastline, from Half Moon Bay, just south of San Francisco, all the way down to the Mexican border, where tons of turtle meat, illegal fish and dangerous clams are smuggled into this country. The day before the sea-lion necropsy, he served a search warrant on a local man who was advertising whale ivory for sale on the Internet. Nearly two dozen sperm-whale teeth were confiscated in the raid.

In the Gulf of Mexico, a single NMFS agent is responsible for three states. Another agent is responsible for the entire west coast of Florida. In Dutch Harbor, Alaska, a desolate rock in the Aleutian chain, agent Meta Mendenhall works alone monitoring the transfer of thousands of tons of Bering Sea pollack from huge factory ships to foreign freighters.

Back in San Francisco, Joe Koczur is reviewing piles of documents seized from a local processing company whose boats are suspected of underreporting their catches. He is also trying to get a handle on a "mosquito fleet" of some 30 small boats that are using cell phones and panel trucks to move unreported fish around the state. He also has a meeting scheduled with a federal task force that's looking into the poaching of marine

Agent Roy Torres surveys the coastline in Pacific Grove, California, for unlawful sea-lion and sea-otter killing.

mammals for the folk-medicine trade. Oh, yes—he has also been asked to help police two nearby National Marine Sanctuaries.

Despite the pressures and problems, NMFS agents enjoy an occasional lighter moment. Pete Chorney recalls doing an airport search for contraband in San Francisco one day. "We opened this crate of harmless eels and about 60 of them slithered onto the floor. 'What's that?' one of the airport workers asked. 'Black mambas,' I said, and that warehouse cleared out in about two seconds flat." Agent Bob Jones tells of an officer being called out one stormy night to check on reports of a possibly sick or injured seal hauled up on a local boat ramp. When the officer got down there, he turned on his flashlight to find the town drunk curled up sleeping next to the seal with his raincoat thrown over it for protection.

"We're the commandos of the conservation movement," says Andy Cohen. "It's tough work and it's not always rewarding. But when my kids grow up and ask me what I do, I'll be able to tell them I'm saving the world. It's a job you can feel good about."

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By Per Ola and Emily d'Aulaire

For Jacques Torres, the highest art is a piece of cake

Sugar in all forms seduces our sweet tooth from the first taste, but in the hands of a premiere pastry chef it becomes magical

Enrico Ferorelli

"Let them eat cake," said Marie Antoinette with regal insouciance as she watched her countrymen languishing in the streets of Paris for lack of bread. To the queen, as the celebrated though doubtless apocryphal tale would have it, cake was as much everyday fare as bread was to the poor, and a simple switch in diet would make everything right for the hungry peasants.

Of course, the very idea was absurd. At the time, cake —or pastry of any kind—was a luxury, and only the rich and the royal enjoyed such treats. During more democratic times, cake did become food for the common man, and part of our common language as well. "A piece of cake" describes a task easy to accomplish, and "icing on the cake" proclaims a final touch—the pièce de résistance. The very word "cake," with or without icing, conjures up images of special occasions: a birthday, a graduation, a wedding.

It is a remarkable cake that first catches our attention and draws us to its creator, Jacques Torres, the pastry chef at New York City's renowned four-star restaurant Le Cirque. With a list of culinary honors as long as the restaurant's menu, Chef Torres, at 37, is considered one of the grand masters of modern patisserie.

To learn more about his art, we join Torres at Le Cirque, where he has agreed to take us on as his "apprentices for a day." After welcoming us into his crowded 8-foot-by-16-foot pastry kitchen, the ebullient chef hands each of us a white jacket and apron.

"First thing, we check the inventory," he declares as he sticks his head deep inside a large refrigerator. "We'll need to do macadamia nuts, also bomboloni. There are only 75 fondants. We'll need to make more," he announces, as though we'd worked alongside him for years.

Torres introduces us to one of his apprentices, Alisson Bronte, a student from the Culinary Institute of America. The young man is putting the finishing touches on the cake we first admired. "Miniature Stove 'Le Cirque' with Coffee, Hazelnut and Chocolate Biscuit" (at right), reads the entry on the dessert menu, and it's remarkable enough to impress even Marie Antoinette.

The classic Biscuit Opera, named for the Paris opera house designed for Emperor Napoleon III in 1860, is an impressive cake, but once embellished, Torres-style, it becomes a work of art.

The cake is cut into rectangles and placed inside the oven of a miniature stove made of thin slices of chocolate, complete with oven door, dials and stovepipe. On top of the chocolate burners rest two small, perfectly formed chocolate saucepans, one containing raspberry

Chef Torres displays a tray of "Miniature Stove 'Le Cirque' with Coffee, Hazelnut and Chocolate Biscuit" (left), his certain-to-please signature dessert.

Photographs by John Uher

de
Ciraue

The French have long been fans of the confectioner's craft; *La Patisserie Gloppe,* painted by Jean Béraud in 1889, during the heyday of Parisian patisserie, offers a glimpse inside a tony shop on the Champs Elysées.

sauce, the other mango. During *la présentation,* Torres explains, the waiter lifts the tiny saucepans and ceremoniously pours the contents over the cake.

But that's not all. We watch the apprentice "tile" the serving plate using pastry tubes filled with melted chocolate. Bronte outlines small squares on each plate, then fills them with the multihued sauces, creating the effect of a brightly colored tiled floor. Voilà: a deliciously edible miniature kitchen on a plate.

The idea for such a dessert, Torres tells us, evolved from a gift he and some friends concocted to celebrate the 70th birthday of the late chef Pierre Franey. "We decided a full-sized sugar stove would be a perfect gift," he grins. "We made the stove, the pans. We put a red lamp inside the oven to make it glow. It was the hit of the evening," he exclaims. "But putting something so big and delicate in the back of a station wagon to transport it was a nightmare."

There was a time when such elaborate cakes were not unusual. In those days, the miniature stove that dazzles us in Torres' kitchen would have been about as impressive as a cupcake, when bigger was better and some desserts took on the proportions of a Cecil B. DeMille epic. Cakes served in Europe during the Middle Ages were more for show than sustenance—a way to display the wealth of the upper class. These flamboyant creations were often filled with "surprises"—*major* surprises—such as live animals, jesters and jugglers, women in stages of undress, even an entire orchestra. The "four and twenty blackbirds" of nursery-rhyme fame was common fare in medieval Paris.

A recipe dating from the 1660s, credited to Robert May, a notable cook for English nobility, called for a sugar stag that bled red wine when an arrow was pulled from the animal's side. Another of his sugar schemes was a castle that fired spears and arrows at a confectionery battleship. But there's no mention of anyone actually eating these grandiose "subtleties," as they were then called.

People have always had a sweet tooth. Studies have shown that newborn babies, before being nursed by their mothers, react with obvious pleasure to a sugar solution. It's a matter of survival. Attraction to sweets, explains food researchers, is the way to get the calories that our bodies require, or used to require when we were hunter-gatherers.

Figs, dates and honey were the first to tempt our sweet tooth; but it was the widespread use of refined sugarcane that shaped the fine art of confectionery. It was introduced in Europe in the 12th century when the Crusaders brought it back after their sweep through the Middle East. For years the sweetener was worth its weight in gold. When Maria Theresa, future queen of Hungary and Bohemia, married in 1736, sugar was list-

As you leave the ship behind and wend your way through the *lushness* of the Costa Rican rainforest, the notes from last evening's *recital* of Haydn's Cello Concerto No.1 mark your every step.

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Eric Girérd of New York's San Domenico pays homage to Humphrey Bogart by re-creating the actor's hat.

An incredible, edible grand piano by Girérd combines chocolate with praline, hazelnut and coffee flavorings.

ed alongside gold and precious gems on her inventory of wedding gifts. It wasn't until the 19th century that sugar became an affordable treat for the masses.

Because of its pliability after melting, sugar is the perfect material for the confectionery craftsman; it can be spun, blown, molded, poured, piped or pulled.

Chocolate, another building block of confectionery artistry (SMITHSONIAN, February 1986), found its way from the New World to Europe aboard the ships of returning seafarers. Christopher Columbus was the first to return to Spain with cacao beans. But chocolate remained the secret of Spanish monks and nobles until 1615 when the 14-year-old daughter of Philip III of Spain married Louis XIII and took the secret with her to France, where chocolate became a fashionable luxury.

Today there are glossy magazines devoted to chocolate, stores that sell nothing but chocolate, cookbooks dedicated to the subject, even several chocolate lover's cruises through the Caribbean, like the one that promises "eight days and seven nights of pure chocolate bliss."

Chocolate is certainly one of the main ingredients in Jacque Torres' repertoire of confectionery wonders. As we begin our workday with him, we are surprised when Torres treats a ten-pound block of solid chocolate with less than blissful reverence. After wrapping it in clear plastic, he throws the dark hunk violently to the floor. It lands with a sharp crack, breaking into smaller chunks. "It makes it more suitable for melting, but I have to make sure the manager isn't here when I do this," he says, glancing over his shoulder with a mischievous grin. "Sometimes I chip a floor tile."

Torres is a practical joker who loves to play pranks on his coworkers, like slipping a raw egg into an apprentice's shoe. Yet he takes his role as teacher and mentor quite seriously.

"Every chef has to give something," he tells us. "We have to pass on the art." Torres is doing just that, for he has recently been named Dean of Pastry Arts at New York's prestigious French Culinary Institute. (He is also at work on a new PBS series due out next January.)

Torres gives the impression that he is a perpetual student himself. "My theme for work is fun," he says. "I like to build on classic desserts and invent new ones. I am always seeking whimsy and diversity. I want each dessert to have contrasts in taste, in texture, in color and form. I want to make people smile, to wake them up and give them a little fun at the end of the meal."

"His ideas can come from anywhere," says Kris Kruid, Torres' longtime companion. "He's always improvising with unorthodox tools to create new shapes and textures. Once he took the fixture off a ceiling light in the kitchen because he thought it would make an interesting chocolate mold. There's nothing Jacques won't pour chocolate over, even plastic bubble wrap," she laughs. "I have to keep a sharp eye on everything

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"Four and twenty blackbirds" were served live in a medieval pie, though added after baking the crust.

around our home—even my grandmother's crystal." Torres grins sheepishly: "I want people to have a reaction when they see my desserts."

Kris recalls the time the Frenchman tasted his first piña colada. "He fell in love with the taste of coconut and pineapple," she says. "He couldn't wait to try it out in the restaurant." The result: "Cocotte"—a miniature cauldron of dark chocolate filled with sponge cake in pineapple juice and coconut liqueur. Torres sprays the outside of the kettle with a paint gun filled with lighter chocolate to make it look rusty. Then he places the kettle on a "flame" of yellow mango and raspberry puree. Fine fibers of spun sugar mimic steam that appears to lift the chocolate lid on top.

Not all of his experiments are quite so successful. Torres loves the smell of pipe tobacco, so once he tried to infuse the odor into ice cream. "That was bad," the chef admits. "But you know what? We try. Experimentation is the interesting thing about my profession. I want my pastry team to share a sense of adventure, the constant search for new ideas. There is joy in the restaurant. There must be joy in my kitchen as well."

There *is* joy in his kitchen—along with tremendous energy. Clad in colorful pants decorated with fruits and desserts (he personally orders them for his staff; "so much more interesting," says the chef) he is a whirling dervish, chattering nonstop, doing everything: cooking, cleaning, even answering the phone.

"*Bonjour, cuisine,*" he says, grabbing the phone with one hand while stirring hunks of melting chocolate with the other. The chef from the elegant Hotel Carlyle asks where Torres orders his figs. "California," he responds, still stirring. "Fresh and wild." He rattles off the supplier's number from memory.

Moments later, another call; this time it's the manager of Lutèce, another four-star restaurant, looking for an assistant pastry chef. Torres gives the caller a few names along with the advice that if they want quality, they are going to have to pay for it. "You don't get a BMW if you pay for a Yugo," he says.

No sooner does he hang up the phone than it rings again. It is the sous-chef from Fauchon in Paris, telling Torres he's coming to New York the following day and wants a reservation at Le Cirque for lunch. "No problem," Jacques replies. It was the same response we heard each time someone entered Torres' tiny kingdom with a request: "I'll do it. No problem."

The small talk stops as Torres turns his full attention to the melting chocolate. He cools it down by adding more chunks and stirring until he has the correct temperature and consistency. Experience has made Torres his own thermometer. He can tell from the appearance and feel of the chocolate when it is ready to work with.

The chocolate looks perfect—glistening and smooth. Then Torres plunks down a large bowl of caramelized macadamia nuts on the counter. We take turns pouring the chocolate slowly over the nuts while Torres plunges his hands into the bowl and tosses the nuts into the air to coat them evenly. When we finish, he shakes powdered sugar on top of the perfectly coated nuts and transfers them to a large flat sieve, shaking the candy of excess sugar. "See," he laughs, "it is like construction. No?"

Next Torres shows us how to make chocolate fondants. He combines chocolate, butter, salt and cocoa powder in a bowl and mixes in sugar and whipped egg white. Then he places the 40-quart, 3-foot-tall bowl on the floor and drops to his knees beside it. Using his hands, he gently massages the contents until the mixture becomes thick and velvety. "I cannot get the results I want with a machine," he says. "A machine would break down the egg whites. I am the machine."

When the confection is thick and viscous, he pours it into metal molds; 150 of them. As the fondant bakes, a crust forms, but the center stays soft. The dessert, "Warm Chocolate Fondant with Vanilla Whipped Cream and Orange Sauce," is a steal at $11 a serving.

Specialized equipment to make pastry can be expensive, so Torres likes to improvise. "The tools I invent or adapt are not only economical," Torres tells us. "They

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From a lump of sugar, Torres crafts a delicate swan: he heats, cools and shapes it into a ball, then he blows air into it forming a body, neck and head. Next he cuts and forms a wing.

give me the exact result I want." He keeps his equipment in a simple gray toolbox. It's an eclectic mix: a carpenter's level, scissors, paintbrushes, shapes cut out of plastic buckets, a small blowtorch, an ice pick, a hair dryer.

"There's almost nothing I can't do with chocolate or sugar," Torres explains. He tells us about a celebrity customer who presented him with a video of herself and a request to model her nude body in chocolate. "Now that was an interesting assignment," he grins, raising a Gallic brow. Another customer wanted only her breasts re-created in pastry; another asked him to fashion a chocolate sculpture of the family dog.

Jacques Torres is just one of a number of pastry chefs across the United States turning out ingenious fantasies that are considered edible art—very edible.

Philippe Laurier in East Rutherford, New Jersey, creates a wishing well of Biscuit Jaconde, filled with a black currant mousse and a mango mousse, garnished with pulled sugar and covered with a filigree roof of white chocolate. At New York's San Domenico, Chef Eric Giréard serves a thin wafer of chocolate in the shape of a baby grand piano, complete with keyboard and raised lid. Randy Gehman, at the Four Seasons Resort and Club in Dallas, Texas, dazzles his clientele with realistic and mouth-watering truffle-filled chocolate golf balls.

Torres has fashioned desserts for presidents and kings, but his proudest moment was serving Pope John Paul II during the pontiff's visit to New York in 1995. He fixed "something special," a replica of the Vatican dome in chocolate, surrounded by petits fours. "I think the dessert was special for him," says Torres. After the meal the pontiff called the cooking staff to him and presented each with a rosary. "I sent mine to my mother in France," says Torres. "She has never liked a present more."

Glancing at his watch, Torres checks his "to do" list, and we know our work isn't finished. Our next task: bombolonis. He hands us small wheels of dough and shows us how to roll them into small balls between our palms. Torres turns out perfect balls with amazing speed while we struggle clumsily to make a few that look a bit square.

After they rise, the dough balls are deep-fried, glazed with sugar and filled with a light cream sauce. Each is served with a creamy marsala zabaglione. Laughing, Torres tells about the time on a "Culinary Crossing" on the *Queen Elizabeth 2* when a helper switched bowls and Torres dusted one of his creations with salt instead of sugar. "Those," he says, "were not so popular."

"Desserts are a challenge," he tells us as the last of the dough balls are set aside to rise. "They are served after the meal so we try to make them not too sweet, not too heavy. And we have to remember that people are health conscious today." We glance at the massive bricks of butter and chocolate, and the sacks of sugar stacked on the counter. So far we've seen little serious concessions to the health conscious.

As Torres checks his list once again, the maître d'hôtel hurries across the main kitchen toward us. "This could mean trouble," Torres murmurs when he sees him coming. But the maître d's request is a piece of cake, literally and figuratively. A customer has just requested a chocolate cake for dinner that evening, inscribed with "Happy Anniversary to Doctor and Doctor" on the frosting. "That's easy," says Torres, relieved.

Shortly after 11 A.M., it is time for the "family meal." Before the customers arrive for lunch, Torres and his team sit at a worn wooden table in the main kitchen for a meal. It isn't the "Black Sea Bass wrapped in a Crispy

A heat torch keeps the sugar soft and pliable so that feathers can be attached. Once the swan is formed, Torres paints eyes and beak on the lovely creature, which will star on a wedding cake.

Potato Crust with Red Wine Sauce and Braised Leeks," or the "Toasted Stuffed Saddle of Rabbit with Kidneys, Mushrooms and Gnocchi with Carrots and Sage Sauce," being offered to the patrons, but it is delicious. It's a pasta with a tomato and meat sauce, a fresh green salad and French bread warm from the oven. Torres eats only his salad. "I have to stick to low-fat," he explains, "or I can't eat my desserts."

After our lunch, the pace quickens in the kitchen as customers fill the dining room. There is a sense of urgency, as waiters appear with dessert orders and everyone pitches in to help, including Torres: "Roasted Figs in a Crispy Brick Crust with Seasonal Sorbet"; "Warm Chocolate Cake with Raspberries Wrapped in a Crispy Filo"; "Exotic Fruit Soup in a Light Lime Syrup," all arranged with artistic perfection. And of course there were orders for the "Stove 'Le Cirque'"—as well as the much-loved bomboloni, *our* bomboloni.

After the last luncheon guest leaves, we are ready to collapse. Torres, however, is just revving up, ready to shift into high gear for the onslaught of dinner guests. Reaching for a large bowl, he turns his attention to the anniversary cake that had been ordered on short notice. While he mixes and stirs, we lean exhausted against the wall—there are no chairs in the kitchen. We ask Torres about his wedding cakes, considered the flagship of the confectioner's craft.

"I prefer second weddings," he admits. "First weddings are white, white, white. Cakes come straight from the bridal magazines with ornate ribbons, elaborate columns and a plastic bride and groom on top. All the cakes look the same. But second weddings, when the bride says, 'Do whatever you want. Just make sure it's original.' For me, that's more fun."

Shortly before Torres moved to the United States, a couple in France commissioned him to make their wedding cake. They had just one stipulation: they wanted a cake large enough for the couple to hide inside it and pop out at the appropriate moment.

Torres promised something spectacular. He built the "cake" out of plywood and Styrofoam. Then he slathered the two layers with meringue, making the construction appear edible. The bride, an equestrian, inspired Torres to place an antique wooden carousel horse on top. The bride and groom, along with a cage full of doves, hid inside the base of the cake.

"The whole thing was about 20 feet tall," recalls Torres. "We rolled the cake into the tent where the guests waited. The happy couple pushed against the door and popped out, surrounded by flapping doves. It was wild. I think it's the craziest thing I've ever done."

Torres'extravagant wedding cake was in the tradition of the *pièces montées*, popular in the 18th and 19th centuries. These large and elaborate creations showcased the artistic abilities of the confectioner, often more concerned with style than savor. The king of the pièces montées, Marie-Antoine Carême, was considered by many the father of French haute cuisine.

Carême viewed patisserie as one of the fine arts along with painting, sculpture, poetry and music. Working with drawn sugar in a variety of colors ranging from violet to green, he would craft grand Indian pavilions, multitiered Turkish fountains and the great ruins of Athens. Though undoubtedly better looking than tasting, Carême's pièces montées were all, in fact, edible.

Jacques Torres' road to superchefdom began in the south of France, in Bandol, a small Mediterranean fishing village—"faster to bicycle around than Central

Park," he says. At the age of 15, he announced that he wanted to be a chef, and one of his two older brothers, already a chef, suggested that Torres create his niche in pastry since there were very few restaurants in town. But there was a splendid pastry shop.

The teenager signed on as an apprentice, working after school and during vacations. Torres still remembers the smell of the rising dough that permeated the tiny shop and the first batch of croissants he pulled from the oven. "I knew then that's what I wanted to do," he says. "From my carpenter father I inherited the joy of working with my hands. Like him, I create things, but with pastry there is a bonus; I can eat the results."

After his apprenticeship, the young chef worked in a number of small pastry shops in Provence. In 1980, on a bet with a friend, he walked into the famous Hotel Negresco in Nice and asked for a job. To Torres' astonishment, Michelin two-star chef Jacques Maximin told him to come back within an hour, ready to work.

He learned fast. In 1986, at the age of 27, he became the youngest chef to earn the prestigious Meilleur Ouvrier de France for pastry, one of the highest culinary honors in France. Always modest, Torres claims the reason he won the coveted prize is that he was under no stress. "I was just thrilled to be a finalist," he says.

Before the dinner guests arrive at Le Cirque, Torres turns his attention to a birthday cake. "Now we're going to have some fun," he announces, as he drops a lump of molten sugar onto the hard surface of a heat-resistant piece of rubber called a silpat. He wears no gloves; years of working with hot sugar have created calluses, making them unnecessary.

Pulling, molding, cutting and blowing, he turns the shapeless lump of sugar into a regal, ribbon-bedecked swan. He works under a heat lamp to keep the sugar from hardening. Before attaching the swan's wings, he softens them with a heat torch.

As he weaves his magic, he periodically tosses his scissors into the air and catches them again, sharpshooter style. His team gathers to watch, wide-eyed. "I like people to see what's going on," Torres confides. "That way they can learn. It's the way it's supposed to be."

Torres was like a magician at a birthday party. The transformation we see is a combination of skills: glassblowing, designing, engineering, chemistry, sculpting and, of course, confectionery artistry.

A winner of countless awards and honors, and a regular on Julia Child's *Master Chefs* television series, Jacques Torres is a celebrity. But we learned that his job is far from glamorous. Although he is free to leave during the evening shift when his assistant, Keitaro Goto, takes over, he rarely does. If the restaurant is busy or there are special desserts to prepare, he stays. He works six days a week, and it's not unusual for him to begin work at 8 A.M. and finish at midnight.

At the end of our day, after the last dessert has been served, Torres walks us to the sidewalk outside the restaurant. The cool evening air feels good against our faces after so many hours inside the small kitchen. The narrow street is lined with stretch limousines, the drivers waiting behind smoked glass for diners eating Torres' desserts inside. Our backs ache and our feet are sore. We marvel at Torres' tireless energy as he bids us goodbye and rushes back to work.

Jacques Torres has big dreams for the future. He loves working with a new generation of pastry chefs at the French Culinary Institute and hopes to widen his teaching audience with his new TV show and its companion cookbook. He is excited about the large pastry kitchen he has designed for himself at the new Le Cirque. "State of the art," he declares, "the most beautiful kitchen in all of New York City." (The restaurant reopens next month at the New York Palace Hotel.)

But what makes him truly happy will never change. "My reward," he says simply, "is a happy customer—and an empty plate."

All: John Tsantes

For the Smithsonian's 150th Anniversary, a dream team of pastry chefs made cakes inspired by the Castle (below) by Laureen Gauthier, New England Culinary Institute; the Sackler Gallery (left) by Steven Klc, Washington, D.C.; the Freer Gallery (above) by Stanton Ho, Las Vegas.

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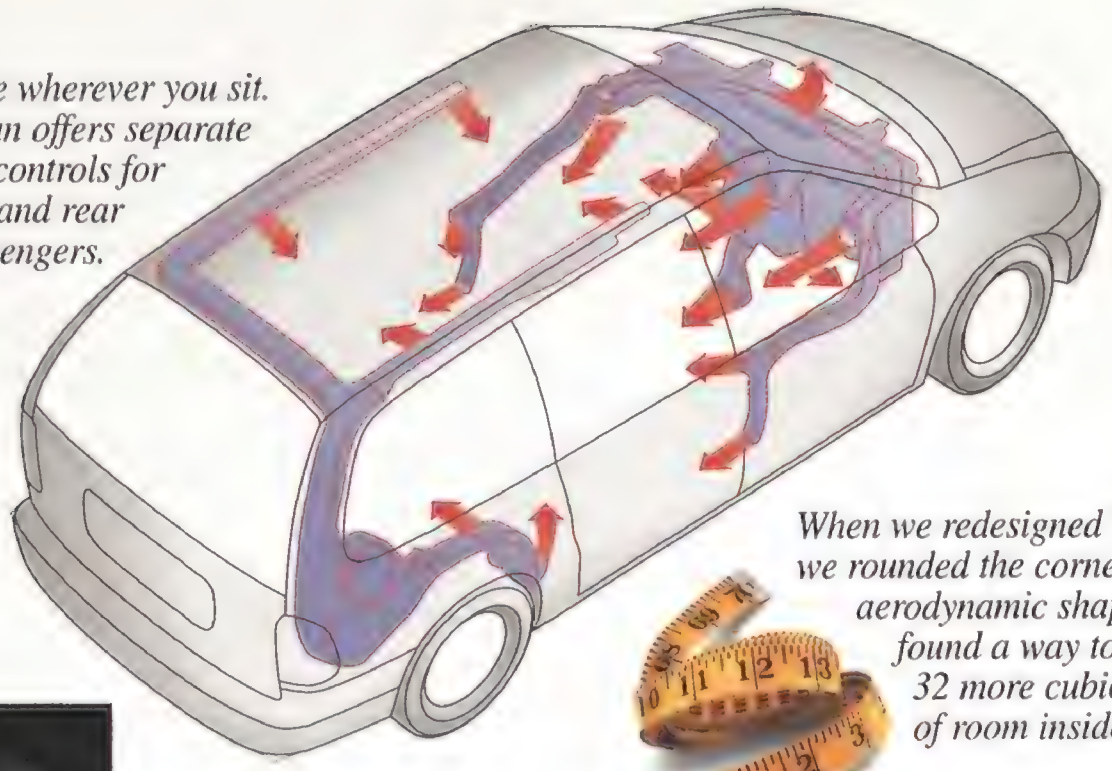

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By Barbara Holland

Cleopatra: what kind of a woman was she, anyway?

Serpent of the Nile? Learned ruler? Sex kitten? Ambitious mom? African queen? History is still toying with the poor lady's reputation

Until now, everyone has had pretty much the same fix on Cleopatra: passion's plaything, sultry queen, a woman so beautiful she turned the very air around her sick with desire, a tragic figure whose bared bosom made an asp gasp when she died for love. Inevitably, the best-known incarnation of her is Hollywood's: Theda Bara, Claudette Colbert, Elizabeth Taylor, telling us what fun it was to be filthy rich in the first century B.C., spending days in enormous bathtubs and nights in scented sheets. Drinking pearls dissolved in vinegar. (Do not try this at home; it doesn't work.) Lounging around on a barge, being waited on hand and foot. Sometimes the asp looks like a small price to pay.

Hollywood's queen rests less on George Bernard Shaw's Cleopatra, who is a clever sex kitten, than on William Shakespeare's; in the Bard's *Antony and Cleopatra* she's a fiercer soul, downright unhinged by love for Mark Antony. Of course, they both had to leave out her children. Everyone does. It's tough being the world's top tragic lover with four kids underfoot. Even if you can get a sitter, it doesn't look right.

The latest version, part of the current debate about the possible influences of Africa on Greek and Roman culture, suggests that she was black. The last time we looked she was a Macedonian Greek, but the black-Cleopatra advocates like to point out that since nobody knows anything about her paternal grandmother except that she wasn't legally married to Ptolemy IX, it is possible that she was black.

Most classical scholars disagree. Some note that though Ptolemy II, more than a century earlier, had an Egyptian mistress, the Ptolemies were wicked snobs, so proud of their bloodline, not to mention the line of succession to their throne, that they tended to marry their brothers and sisters to keep it untainted. When they picked mistresses, they customarily chose upper-class Greeks. They felt so superior to the Egyptians, in fact, that after 300 years in Alexandria, they couldn't say much more than "good morning" to the locals in their native tongue; Cleopatra was the first in her family to learn the language.

Nobody should be surprised at such claims, however. For the fact is that for purposes political and otherwise, people have been fooling around with Cleopatra's image to suit themselves for centuries. In *All for Love* John Dryden gives us a traditional Cleo less a queen and a ruler than an addictive substance. Shaw made her stand for everything unBritish and thus deplorable. In the course of his *Caesar and Cleopatra* she evolves from a superstitious, cowardly little girl into a vengeful, bloodthirsty little girl. To underline his point he lops five years off her actual age and leaves her under the thumb of a sturdy Roman governor, forerunner of the wise and kindly British administrators of later colonies full of childish foreigners.

Of course, nearly everyone's story goes back to Plutarch, the first-century Greek biographer, who included two versions of Cleo. He knew the writings and stories of people in her part of the world who remembered her as a scholar in their own refined tradition, so unlike the ignorant, loutish Romans; a mothering god-

Sultry Theda Bara played Cleopatra for a 1917 silent film; four Cleo movies had already been made. Cleo OK'd her coin portrait (above), but was it a likeness?

dess; a messiah sent to liberate the East from under the jackboots of Rome. On the other hand, he had the Roman story, largely attributed to her enemy in war, and conqueror, Octavian (who later became the emperor Augustus—portrayed as the clueless husband of the evil Livia in the television series *I, Claudius*). Octavian worked hard to set her up as everything scheming, treacherous, female, foreign and, most of all, sexually rapacious. His Queen Cleopatra was a drunken harlot, the wickedest woman in the world.

Actually, where we can reasonably deduce them, the facts are more interesting than these exotic scenarios.

Cleopatra VII was born in 69 B.C., the third child of Ptolemy XII, called Auletes, known as the Flute Player. Egypt was still rich, then, but its ancient empire had been nibbled away, and the natives, unfond of their Macedonian masters, were restless. The Flute Player kept going to Rome to get help in holding onto his throne. He may have taken Cleopatra along when she was 12; she may have watched the Roman loan sharks charge him 10,000 talents, or nearly twice Egypt's annual revenue, for services to be rendered.

Cleo was a sumptuously clad blonde in Tiepolo's florid 18th-century view of her meeting with Mark Antony.

Not only couldn't he control his subjects, he couldn't do a thing with his children. While he was away his eldest daughter, Tryphaena, grabbed the throne. After she got assassinated, second daughter Berenice grabbed it next—until Ptolemy came back with Roman help and executed her. Cleopatra, now the eldest, had cause to ponder. She knew Egypt needed Roman help, but paying cash for help was beggaring the state. She knew she had to watch her back around her family. I suppose you could call it dysfunctional.

She seems to have found herself an education. Cicero, like most Romans, couldn't stand her, but he grudgingly admits she was literary and involved like him in "things that had to do with learning." The Arab historian Al-Masudi tells us she was the author of learned works, "a princess well versed in the sciences, disposed to the study of philosophy." According to Plutarch she spoke at least seven languages.

In 51 B.C., when Cleopatra was 18, the Flute Player died and left the kingdom to her and her 10-year-old brother (and fiancé) Ptolemy XIII. The reign got off on the wrong foot because the Nile refused to flood its banks to irrigate the yearly harvest. A court eunuch named Pothinus reared his ugly head; he'd got himself appointed regent for little Ptolemy, squeezed Cleopatra clear out of town and began giving orders himself.

Rome, meanwhile, was in the process of shedding its republican privileges to become an empire. An early phase involved the uneasy power-sharing device called the First Triumvirate, with Caesar, Pompey and Crassus (a money man) jointly in charge. It wasn't Rome's brightest idea. Caesar and Pompey quarreled, Caesar defeated Pompey in Greece, Pompey took refuge in Egypt. Not wanting to harbor a loser, the Egyptians had him murdered and cut off his head and presented it to victorious Caesar when he sailed into Alexandria to collect the defunct Flute Player's debts. Pothinus had reason to hate and fear Rome. He was very likely plotting to do in Caesar, too, who took over the palace and stayed on with a guard of 3,000 Roman soldiers. He couldn't take his ships and go home; the winds were unfavorable.

Cleopatra needed a secret word with him, so as we've all heard, she got herself rolled up in some bedding and had herself delivered to Caesar as merchandise. According to Plutarch, Caesar was first captivated by this proof of Cleopatra's bold wit, and afterward so overcome by the charm of her society that he made a reconciliation between her and her brother. Then he killed Pothinus. So there was Cleopatra, at the price of being briefly half-smothered in bedding, with her throne back. And of course, sleeping with Caesar, who was in his 50s and losing his hair.

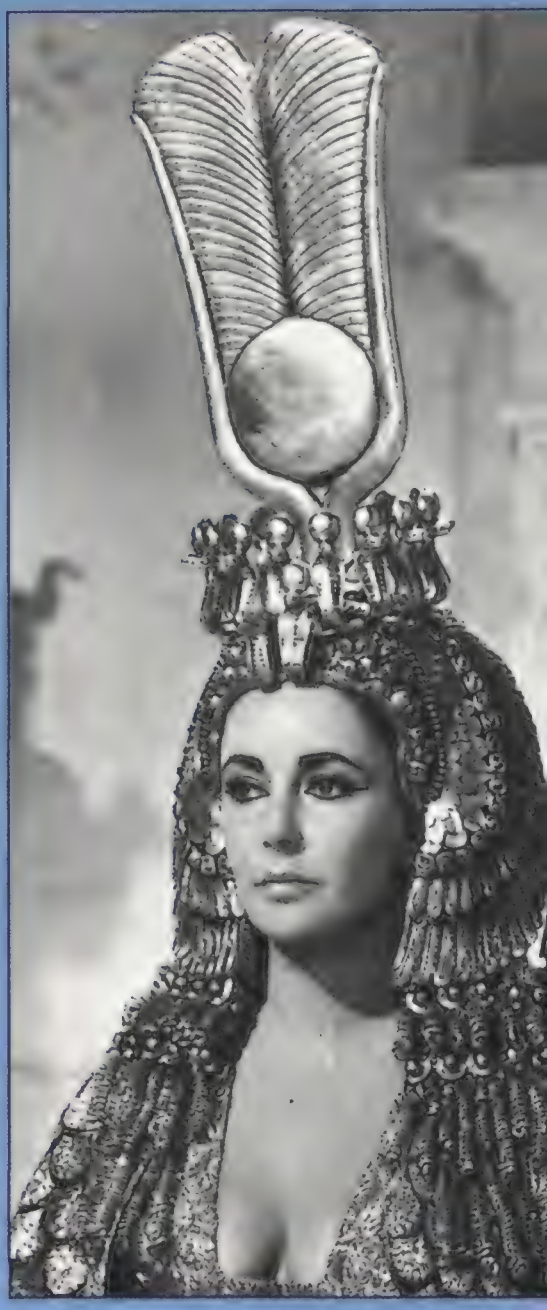
The 1934 *Cleopatra*, a Cecil B. DeMille extravaganza featuring Claudette Colbert, had legions of scantily clad, long-stemmed lovelies who primped and postured. Colbert's Cleo was sophisticated, tart and cunning.

How did she do it? Cleopatra's looks are one of the burning issues of the ages. European painters tend to see her as a languishing blue-eyed blonde with nothing to wear but that asp. However, there's a coin in the British Museum with her profile on it, and she looks more like Abraham Lincoln than a voluptuous queen. Most people who have written about her agree that she commissioned the coins herself and, being a woman, was vain of her looks, so even this profile could have been downright flattering. In any case, it launched a lot of cracks about her proboscis. Had Cleopatra's nose been shorter, according to 17th-century French writer Blaise Pascal, the whole face of the world would have been changed. However, there's no evidence that Antony was unhappy with her nose the way it was.

Or maybe it wasn't so long. Maybe she thought more of her kingdom than her vanity and wanted to scare off possible enemies by looking fierce. Considering the speed with which she corrupted Rome's top commanders—both of them widely traveled, experienced married men—it's possible she looked more like a woman and less like Mount Rushmore than she does on the coins. Besides, the second-century Greek historian Dio Cassius says Cleopatra seduced Caesar because she was "brilliant to look upon . . . with the power to subjugate everyone." (She knew a few things about fixing herself up, too, and wrote a book on cosmetics full of ingredients unknown to Estee Lauder, like burnt mice.) And Plutarch reports that "It was a pleasure merely to hear the sound of her voice, with which, like an instrument of many strings, she could pass from one language to another. . . ."

She bowled Caesar over, anyway, and when reinforcements came he squelched the rebellious Egyptian army for her. In the process he had to burn his own ships, and the fire spread and took out part of Alexandria's famous library, which housed most of what had been learned up to the time—Shaw called it "the memory of mankind." When the smoke cleared they found Ptolemy XIII drowned in the Nile in a full suit of golden armor, but as far as we know, his sister hadn't pushed him. Caesar then married her to her youngest brother, Ptolemy XIV, age 12, whom she ignored. When Caesar left, she was pregnant. Anti-Cleopatrans scoff at the notion that Caesar was the father, claiming he never admitted it himself, but there was plenty he never admitted, including his whole Egyptian fling, and somehow it seems likely. Giving the childless Caesar a son was a much shrewder move than getting pregnant by your 12-year-old brother; as policy it might have done wonders for Egypt. She named her son Ptolemy Caesar, always referred to him

Barbara Holland, who often writes wryly about history and politics for the magazine, is the author of several books, including Endangered Pleasures *(Little, Brown).*



Close-ups of Cleos of stage, screen and opera reveal a dazzling assortment of mock Egyptian regalia and femmes fatales: (above) Colbert; Vivien Leigh in 1946 film of Shaw's *Caesar and Cleopatra*; (right) Tallulah Bankhead in a Broadway production in 1937—critics said she barged down the Nile and sank.

as Caesarion, and took him with her to Rome in 46 B.C. Mindful of her father's mistake, she took Ptolemy XIV, too, so she could keep an eye on him.

In Rome she was Caesar's guest. They gave fabulous parties together. He put up a golden statue of her in the temple of Venus Genetrix, causing a scandal that made him more vulnerable to the people who were plotting to kill him, as they did in March of 44. After he got stabbed, it turned out that he hadn't named Caesarion as his heir, but his great-nephew Octavian, so Cleopatra had to pack up and go home. When brother Ptolemy XIV conveniently died, she appointed the toddler Caesarion as coruler.

Here the record loses interest in her for several years, between lovers, but she must have been busy. She'd inherited a country plagued by civil wars, Egypt was broke, and twice more the Nile floods misfired. Somehow, though, by the time the West began to notice her again, peace reigned even in fractious Alexandria. She'd played her cards deftly with Rome and her subjects loved her. According to the first-century A.D. Jewish historian Josephus, she'd negotiated a sweetheart real estate deal with the Arabs and in general managed the economy so well that Egypt was the richest state in the eastern Mediterranean. So rich that Mark Antony came calling in 41 B.C. in search of funds to finance an attack on the Parthians.

By then the Romans were pigheadedly pursuing the triumvirate notion again, this time with Octavian, Lepidus and Antony. If you believe Plutarch, Antony was simple, generous and easygoing, though a bit of a slob. Cicero says his orgies made him "odious," and there's a story that, after an all-night party, he rose to give a speech and threw up into the skirt of his toga while a kindly friend held it for him. Still, he was doing all right until Cleopatra came along, when he was, as Dryden laments, "unbent, unsinewed, made a woman's toy."

Plutarch's description of their meeting on her barge makes poets and movie producers salivate. Who could resist those silver oars and purple sails, those flutes and

Above, soprano Beverly Sills sings in Handel's opera *Guilio Cesare*; left, Elizabeth Taylor in the 1963 film mostly famous as the beginning of Taylor's tempestuous goings-on with her Antony, Richard Burton.

harps, the wafting perfumes, the costumed maidens, and the queen herself dressed as Venus under a canopy spangled with gold? Not Antony, certainly. She knew what he'd come for and planned to drive a hard bargain. Naturally, they became lovers; they also sat down to deal; she would pay for his Parthian campaign, he would help fight her enemies and, for good measure, kill her sister Arsinoe, her last ambitious sibling.

Antony came for money and stayed to play. A sound relationship with Rome was tops on the whole world's agenda at the time. So, like a perfect hostess, Cleopatra lowered her standards of decorum and encouraged her guest in rowdy revels that have shocked the ages. The ages feel that all that frivoling means she was a frivolous woman, and not that, like any Washington lobbyist with a pocketful of Redskins tickets, she was putting her time and money where they mattered most.

She drank and gambled and hunted and fished with him. Sometimes they dressed as servants and roamed the town teasing the natives. Plutarch's grandfather knew a man who knew one of her cooks and reported that each night a series of banquets was prepared. If Antony wanted another round of drinks before dinner, the first banquet was thrown out and a second was served up, and so on. Anyone standing outside the kitchen door must have been half-buried in delicacies.

Back in Rome, Antony's third wife, Fulvia, and his brother raised an army against Octavian. (Lepidus, like Crassus, fizzled out early.) She got whipped, and Antony had to bid the fleshpots farewell and go patch things up. Then Fulvia died, and Antony sealed a temporary peace by marrying Octavian's sister, Octavia. Within weeks of that ceremony in Rome, Cleopatra had twins, Alexander Helios and Cleopatra Selene.

She had no time to loll in ass's milk

At the news of Antony's marriage, Shakespeare's queen has hysterics and tries to stab the messenger, but the Bard is guessing. The real queen probably took it in stride. She could recognize a political move when she saw it; she had Antony's alliance and a son to prove it, and a country to run besides.

No one suggests she had a prime minister, and after Pothinus, who would? No one denies, either, that Egypt was in apple-pie order. So there sits our drunken harlot, with Caesarion and the twins in bed, working late by oil light, signing papyri, meeting with advisers, approving plans for aqueducts, adjusting taxes. Distributing free grain during hard times. Receiving ambassadors and haggling over trade agreements. She may hardly have had time to put eyeliner on, let alone loll in ass's milk, and apparently she slept alone.

Antony finally got it together enough to invade Parthia. He needed help again, so he sent for Cleopatra to meet him at Antioch and she brought the children. Some see this as strictly business, but Plutarch insists his passion had "gathered strength again, and broke out into a flame." Anyway, they were rapturously reunited, and she agreed to build him a Mediterranean fleet and feed his army in exchange for a good deal of what is now Lebanon, Syria, Jordan and southern Turkey.

Did she really love him, or was it pure ambition? Ambition certainly didn't hurt, but it seems she was fond of him, though he probably snored after parties. Sources say she tried to introduce him to the finer things in life and dragged him to learned discussions, which at least sounds affectionate.

After a happy winter in Antioch, he went off to attack Parthia and she was pregnant again. The Parthian campaign was a disaster, ending with the loss or surrender of nearly half his army.

But for Cleopatra it was another boy, Ptolemy Philadelphus. When she'd recovered, she went to Antony's rescue with pay and warm clothes for the survivors.

Antique engraving presents Cleopatra leading her fleet away from Actium, thus yielding victory to Octavian.

Presently Octavia announced that she, too, was coming to bring supplies. Antony told her to forget it and stay home. Octavian felt his sister had been dissed and suggested to the Romans that Antony was a deserter who planned to move the capital of the empire to Alexandria and rule jointly with his queen from there.

You could see it that way. In a public ceremony in Alexandria, Antony assembled the children, dressed to the teeth and sitting on thrones, and proclaimed Cleopatra "Queen of Kings" and Caesarion "King of Kings." He made his own three kids royalty, too, and gave them considerable realms that weren't, strictly speaking, his to give. Worst of all, he announced that Caesarion, not Octavian, was Julius Caesar's real son and the real heir to Rome.

Then he divorced Octavia.

All hands prepared for war. If the lovers had been quick off the mark, they might have invaded Italy at once and won, but instead they retired to Greece to assemble their forces, including Cleopatra's fleet. She insisted on sailing with it, too; her national treasury was stowed in the flagship. The upshot was that in 31 B.C. they found themselves bottled up at Actium, facing Octavian across the Ambracian Gulf. The standard version of the Battle of Actium is that while the fight hung in the balance, Cleopatra took her ships and left, because, being a woman, she was a coward and deserted in battle. The besotted Antony, we're told, followed her like a dog, and the fight turned into a rout.

With battles, the winner gets to tell the tale. Octavian was the winner, and he saw Cleopatra as a threat to Rome, a lascivious creature, and himself as a noble Roman able to resist her Eastern blandishments. All we really know is that it was a bloody mess, from which she managed to retreat with the treasury intact, enough to build another fleet with change left over. Octavian wanted that money to pay his troops. She wanted Egypt for her children. Perhaps deals could be made. Antony even suggested killing himself in trade for Cleopatra's life, but Octavian was bound for Egypt and he wouldn't deal.

Thus threatened, the queen swiftly stuffed a big mausoleum with treasure, along with fuel enough to burn it down if all else failed, and locked herself in with her serving maids. It's unclear whether Antony was told she was dead or he just felt depressed, but anyway he disemboweled himself. He botched the job—it's harder than you'd think—and lingered long enough to be hauled to the mausoleum and hoisted through the upstairs window, where presumably he expired in Cleopatra's arms. Victorious Octavian marched into town. He sent his henchmen to the queen, and they tricked their way in, snatched away her dagger, taking her—and her treasure—prisoner.

According to Plutarch, at 39 "her old charm, and the boldness of her youthful beauty had not wholly left her and, in spite of her present condition, still sparkled from within." It didn't help, so she and her ladies dressed up in their best finery and killed themselves. Octavian did the handsome thing and had her buried with Antony. Then he tracked down and killed Caesarion and annexed Egypt as his own personal colony.

The best-remembered Cleo story is the asp smuggled in with the basket of figs. Plutarch, who saw the medical record, mentions it as a rumor, wrestles with the evidence and concludes that "what really took place is known to no one, since it was also said that she carried poison in a hollow comb . . . yet there was not so much as a spot found, or any symptom of poison upon her body, nor was the asp seen within the monument. . . ."

Later it was suggested—probably by Octavian—that she'd tried various substances on her slaves and, so the story usually goes, opted for the asp, but in truth its bite is even less fun than disemboweling. Maybe she used a cobra, whose effects are less visible. But where did it go?

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Some people claimed there were two faint marks on her arm, but they sound like mosquito bites to me. Others insist they saw a snake's trail on the sand outside; fat chance, with all those guards and soldiers and distressed citizens milling around shouting and trampling the evidence.

It looks likelier that she'd brewed up a little something to keep handy. She was clever that way; remember the second brother. Octavian's men had patted her down—"shook out her dress," Plutarch says—but she was smarter than they were. And why gamble on the availability of snakes and smugglers when you could bring your own stuff in your suitcase? When Octavian led his triumph through Rome, lacking the actual queen, he paraded an effigy of her with her arm wreathed in snakes, and the asp theory slithered into history. Maybe he'd heard the rumor and believed it, or maybe he started it himself. It would have played well in Rome. In Egypt the snake was a symbol of royalty and a pet of the goddess Isis, but in Rome it was strictly a sinuous, sinister reptile, typical of those Easterners, compared with a forthright Roman whacking out his innards.

History has always mixed itself with politics and advertising, and in all three the best story always carries the day. But why did the man who was now undisputed ruler of the known world work so hard to ruin a dead lady's reputation? Maybe she'd been more formidable than any of our surviving stories tell. We do know she was the last great power of the Hellenistic world, "sovereign queen of many nations" and the last major threat to Rome for a long time. She might have ruled half the known world or even, through her children, the whole thing, and ushered in the golden age of peace that she believed the gods had sent her to bring to the Mediterranean.

At least she would have left us her own version of who she was, and maybe it would be closer to the truth than the others. And then again, given the human urge to tell good stories, maybe not.

The death of Cleopatra was well suited to overstuffed and underdressed 19th-century Romantic art. In 1874 Jean-André Rixens painted in a basket of figs to carry the asp, but inaccurately deprived Cleo of all raiment.

Babies born in the 21st century

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As the millennium approaches, we stand at the threshold of a dramatic turning point in the history of medicine.

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Now, with our first real understanding of the human body's genetic programming, comes a real chance at real cures.

At Pfizer, a world leader in biomedical research and development, the excitement is palpable. "We are entering a truly revolutionary period in which insights derived from genetic research will shine a powerful light on the root causes of disease," says Dr. Arthur Franke, who heads Pfizer's molecular biology research in neuroscience.

As high school biology students learn, genes determine

1347	1600s	1796
Bubonic plague blamed on vapors rising from earth	"Royal Touch" thought to cure tuberculosis; monarchs mobbed	Discovery of smallpox vaccine

such physical characteristics as hair and eye color, height and weight range. We now know that genes also determine whether we are likely

to develop a range of dangerous and potentially fatal diseases. Our genes play a role in deciding whether we will be susceptible to colon cancer, despite eating low-fat diets and exercising until we drop. Or whether we will be able to gorge on ice cream, chain-smoke and die in our sleep at 90.

Today, an important portion of Pfizer's $1.7 billion R&D budget is spent on genetic research. The reason is obvious: **If genetic coding can cause disease or encourage it to develop, genetic therapy could prevent or cure disease.**

At Pfizer laboratories in the U.S., Europe and Japan, genetic research focuses on understanding the genetics of disease processes—exactly which genes give instructions that create or enable disease, how they do it, and how they might be stopped. "The way we can really use the genetic revolution is to study the genes that are expressed in diseased tissue, compare them to gene expression in normal tissue, and develop a medication to block the actions of the genes found only in the diseased tissue," says Michael Fogliano, Manager of Molecular Sciences at Pfizer.

Genetic research is pointing Pfizer scientists to the types of therapies that once might have seemed like science fiction.

Some examples?

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It's real hope for real cures.

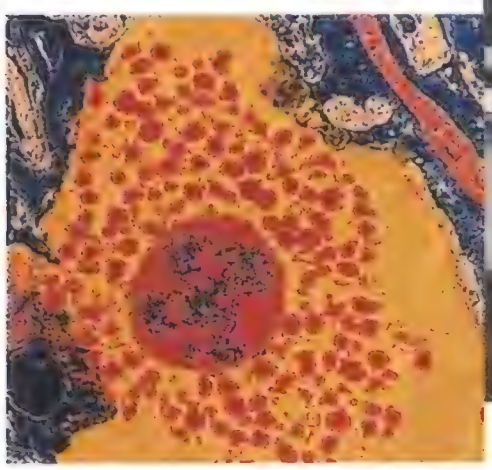
To families who have watched generation after

1842	1918	1920s	1928	1929	1944
Ether's introduction allows surgery without torturous pain	Flu pandemic kills more Americans than any war before or since	Average U.S. life expectancy is 54	Alexander Fleming discovers penicillin in a moldy lab dish	DNA identified in cell nuclei	First ever mass-produced penicillin, from Pfizer, protects WWII GIs

generation of children give themselves daily insulin shots, **it is the promise of liberation from a life-threatening cycle.**

To sons whose fathers fell to heart attacks in middle age, it means new hope.

And to people living in fear of congenital multiple sclerosis or cystic fibrosis, it's the dream that their fears will end.



Medical progress is the source of all these hopes. And what makes it possible is a tremendous commitment of time and resources from Pfizer and other leading research companies.

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1955	1970s	1990s				
Polio vaccine makes iron lung obsolete	First report of AIDS and Ebola	Top 8 killers of 1920s cause few if any deaths today	Average U.S. life expectancy is 76	Cancer is target of 215 drugs in development	First time scientists crack full genetic code of a disease organism	Pharmaceutical industry invests nearly $2 million an hour in research

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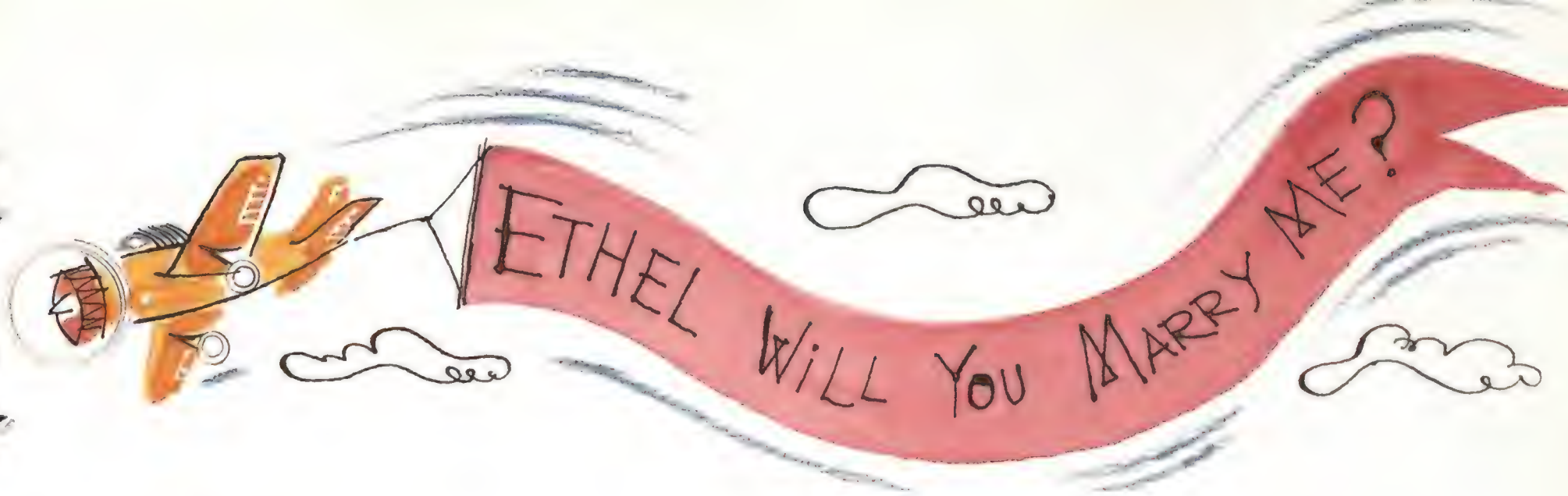


By Michael Kernan

'She said yes! She said yes! She said yes!'

How a few brave and smitten souls got up the courage to declare their love and propose in public, and then lived to tell about it

Not so very long ago, according to the cartoons of my youth, a guy who wanted to get married would hit his girl with a club, grab her by the hair and drag her into his cave.

But a time came when it was discovered that you should *ask* for a woman's hand. You asked her father, of course, and he put a price on her, whether in cattle, gold or debentures. Eventually what passes for enlightenment set in. Nowadays you can ask the girl herself. Or she can ask you.

Today, many amorous couples jump the gun, so to speak, draining a certain significance from a proposal. Perhaps as a result, an odd thing has happened: the proposal has gone public.

"You asked her father, and he put a price on her, whether in cattle, gold or debentures."

This may be the influence of our advertising-besotted age and the possibility that we have to see something on TV in order to believe it. Or it may be that, beneath our hard insouciance, we are still romantics. In any case, Americans are popping the question on talk shows, on billboards and even on the concert stage. Love-struck males hire planes to fly banners over stadiums with messages like "Ethel, Will You Marry Me?" We broadcast our marital message at supermarkets, in airports and almost anywhere where there is a public to be impressed.

Things have gotten to such a pass that one interested party down in Texas has proposed the establishment of an official Proposal Day to occur twice a year at the equinoxes, thus symbolizing the equality of men and women. It is aimed at the people who keep putting it off and putting it off. And there are a lot of them: baby boom women now in their 30s and 40s are roughly three times less likely to marry than were women that age a generation ago.

Inevitably, a lot of ingenuity goes into proposals nowadays, even by those who don't make a public spectacle of themselves. Consider Neil Nathanson and Leslie Hamilton. They met in Palo Alto, California, where they had separate apartments in one of those wonderful old shingled houses. Neil was studying law at Stanford. Leslie had just got her degree in city planning.

They soon discovered that they loved doing crosswords. On Sunday mornings they would hang out together working on the *San Francisco Examiner* puzzle. One Sunday Leslie noticed that many of the puzzle answers struck close to home. "State or quarterback" turned out to be MONTANA, which is where she came from. "Instrument" was CELLO, which she plays. There were references to weddings and marriage, and when she came to "Astronaut Armstrong," which could only be NEIL, she did a double take.

"I was about halfway through the puzzle," she remembers, "when I figured out that a string of letters running across the middle of the puzzle said 'DEAR—WILLYOU MARRYME NEIL.' The missing clue was 'Actress Caron.' I didn't know who that was, it could have been Lauren for all I knew, so I began on the Down clues. Sure enough, it was LESLIE."

She was stunned. She looked up, found him staring at her, and said, "Yes." What else?

It seems Neil had talked to Merl

Illustrations by Rowan Barnes-Murphy

"Then I said, 'I gotta know quickly because I'm leaving for Moscow tomorrow.'"

Reagle, the *Examiner* puzzle maker and a genius of sorts, and they had worked on the project for four months. Neil and Leslie have been married four years and now have a daughter. What did the other puzzle solvers think? For them it was just a neat crossword on the theme of weddings.

Oh, and they invited Reagle to the wedding, in Great Falls, Montana.

"I never did finish the puzzle," she says.

That proposal was relatively private, though attended by millions of readers. Sportscaster Ahmad Rashad proposed to *The Cosby Show* star Phylicia Ayers-Allen live on a pregame TV show. And not too long ago singer Anita Baker, during a Radio City Music Hall concert, handed the mike to a young man who had come up from the audience by prearrangement. In ringing, amplified tones he asked, "Mitzi, will you marry me?" The audience gave the couple a standing ovation.

But what if the girl says no?

Tony Ferrante of Richmond, Virginia, had this great idea: he would lure his friend, Kathryn Webber, to a mall at Christmastime and get her to sit on Santa's lap for a gag photograph. Then Santa would hand her the usual little gift, only the gift would turn out to be an engagement ring.

Unfortunately, Kathryn had just finished her college finals and was tired, hungry and cross. Tony finally persuaded her to see Santa, but the ring hadn't arrived yet. So Tony had to drag her around the mall for another half-hour while a friend fetched the ring. At last Kathryn was sweet-talked into sitting on Santa's lap a second time. Santa gave her a tiny box.

Tony had to tell her to open it. She was so shaken that she couldn't give him an answer; they had never discussed marriage before. He thought he was a goner. But finally, seven hours later at dinner, she took pity on him. "I don't think I ever answered your question," she said. "Yes, I will."

For Cal Ripken jr., the great Orioles shortstop (soon-to-be third baseman), it began with an autograph.

One night in 1983 Joan Geer spotted the ballplayer with outfielder Al Bumbry at a restaurant. She asked him to autograph a napkin for her daughter Kelly. The gallant Ripken wrote, "If you look anything like your mother, I'm sorry I missed you."

Back home, presented with the trophy, Kelly Geer, a six-foot-tall blonde at the University of Maryland, said, "That's nice, Mom. But who is he?"

About two months later, Kelly and a friend happened to be in a restaurant where Cal was appearing for a promotion. The friend said, "Oh look, there's Cal Ripken."

Retorted Kelly, "You mean that guy there with 150 women around him?"

When Kelly finally got through to him, she said, "Thanks for being so nice to my mom."

"Ah," he said. "You must be Kelly."

Cal insists he is not good at names, but this one stuck. The ex-nonstop shortstop, who happens to be 6 feet 4, is a basketball fan, and remembered asking Mrs. Geer how tall her daughter was. As Kelly quipped later, "He wanted to be sure I was good material for producing basketball players."

Up to then she had always told people she was 5 feet 11½.

They went out for lunch, and dated some more, and one thing led to another. On New Year's Eve he invited her to his house for dinner and afterward brought her out to the balcony.

The author, a more or less incurable romantic, has been known to comb the papers for heartwarming tidbits.

She was halfway through the puzzle when she saw it was actually a marriage proposal.

She was persuaded to sit on Santa's lap and he handed her a tiny box.

"You have to see what's in my backyard," he told her.

There, spelled out in Christmas lights stuck through holes in a wooden plaque that he had made himself, she read the words, "Will you marry me?"

She said yes, and several months later, on a Friday the 13th, they were married at the United Methodist Church of Towson, Maryland. They now have two children.

"He can be very romantic," Kelly says.

Yes, well. Romantic is as romantic does. Randi Reese was not the kind of girl that anyone could surprise, or so her parents told Mark Roger. When they attended a performance of *Grandma Sylvia's Funeral,* an Off Broadway play in which the audience takes part, Mark arranged for one of the actors to approach him in his seat and say these lines from the script: "Grandma wanted to will you her engagement ring as long as you have someone you love to give it to."

At this point Mark jumped up, turned to Randi next to him, and said, for all the audience to hear, "Yes, I do! I would like to give this ring to Randi Reese, if she would marry me."

Randi was surprised.

They invited all the cast members to the wedding.

This is one that could very well have gone public but didn't. Al Roker, the *Today* show weatherman and talk show host, first noticed *20/20* correspondent Deborah Roberts when she appeared briefly on the *Today* program in New York. But he was married and she was off to NBC's Miami bureau.

Two years later, in 1992, she returned to Manhattan to work for *Dateline* and asked Al, now divorced, to house-sit. He left flowers, food and "a really nice note." They became friends. Like many baby boomers, Al couldn't get around to the big question. But at last, on a visit to the Grand Canyon in 1995, he got down on one knee and said, "I want to ask you—in front of all this—if you'll marry me."

Al insists that "if she had said no, I could have jumped." But he didn't have to. The marriage was spectacular anyway, in St. Thomas Episcopal Church in New York.

Here's a classic: it seems this Yale law school student kept staring at a certain girl in a civil liberties course. She had Coke-bottle glasses, no makeup and out-of-control hair. When he saw her again in the law library and started gawking, she got up and approached him. "If you're going to keep looking at me and I'm going to keep looking at you, we ought to at least know each other."

They dated, became close, moved to Fayetteville, Arkansas, where he was to teach law at the University of Arkansas. Despite offers from law firms in Washington, D.C., New York and Chicago, she stayed in Fayetteville. "I loved him," she says. "I had to stay."

Then he ran for office and lost, though he later won a big one. She started teaching law at the university, too. They did some dreaming. There was a particular brick house she loved. But she needed time before making any commitments, so she went home to Illinois to think things over.

When she returned, he met her at the airport. "I bought that house you like," he said, "so you better marry me because I can't live in it by myself."

They were married in the house. She took off her glasses for the occasion.

One of the fastest proposers of our fast times is A. Craig Copetas, now a foreign correspondent for the *Wall Street Journal.* A few years ago, while covering the Bush-Gorbachev summit in Malta, he was caught in the harbor

As Kelly quipped later, "He wanted to be sure I was good material for producing basketball players."

in a small boat by the worst storm in years, and was spectacularly seasick.

"I got on the bus to the press center," he recalled, "and I looked like I'd been in the woods for three years. I got some coffee in a café, and then I turned and saw this woman—and I fell in love with her. All I could say was, 'Can I buy you a coffee?'"

She let him do that. Her name was Marie-Céline Girard, a producer for a French news show doing a piece on American news networks.

"She thought I could help her. So I was showing off for her with my face all green and my ugly socks and vomit on my lapels. I asked her for dinner but she said no, she had to leave for Paris in a few hours."

There were no planes to France for three days, but Craig was desperate. "I went to friends at CBS and asked them to get me on one of their chartered jets. People had never seen me like this. I'm not like that at all."

He got to Paris. He didn't speak two words of French but looked up a British friend and crashed in his apartment. He bought a new suit. Called her up ("Hi, remember me?" "Who is this?" "Can you come to dinner tonight?" "No." "So how about tomorrow?"). Took her to dinner. Took her to lunch the next day.

"It was crazy. I was supposed to be in Moscow and she was headed for Prague, but then her flight was canceled so I took her to lunch, bought her $100 worth of dried roses and blew a $300 airplane ticket."

Then he flew to America to see his parents and asked her to join him there for Christmas. She couldn't make it, so he asked her to meet him in Paris for New Year's.

"We went shopping for shoes, I remember, had dinner, and I realized I was in love for good. I asked her to come to London with me for a few days, and she agreed only if we had separate rooms."

Back in Paris, Craig came to a major decision.

"I had seen her only about four times," he said, "but I knew I wanted to marry her. I called the Jules Verne, on top of the Eiffel Tower, perhaps the most exclusive restaurant in Paris, where you have to reserve seven months in advance. I lucked out: the man who answered was from Russia."

Craig spoke Russian, having been stationed in Moscow for six years. He explained that he simply had to propose this very night, and the man said he would arrange everything. Just be there at 8:30.

"Well! We arrive at the restaurant's private elevator at the base of the tower, and the operator says, 'How nice to see you, Mr. Copetas.' We meet the maître d' and he says, 'Oh, Mr. Copetas, how lovely to see you again. Your table is ready.' And it's the best table in the house. And there's a magnum of vintage Dom Perignon chilled and waiting. And I had never been in the place in my life."

All this time, as she would remember

it later, Marie-Céline was thinking: this fellow is civilized, even if he is an American.

"She ordered frog's legs and kidneys, which almost made me throw up all over again," he said. "I pulled out the box and said, 'I thought you might be interested in this.' She was absolutely shocked. Then I said, 'I gotta know quickly because I'm leaving for Moscow tomorrow.'"

She was speechless. She said, "Well, I don't know. I don't know you. Let's finish dinner and then we'll see."

They finished the dinner and then Craig got down on his knees. That did it: she said yes. What is it about knees and marriage proposals?

As she now recalls, "It was two days before my 30th birthday, and I had had some men friends, but no one had ever asked me to marry him. Then the next day it hit me. I looked at my ring and: oh my God, what did I do? First time I was asked and I said yes! And he was off to Moscow, and there I was, all alone in Paris with this ring, and I would have to tell my parents I was marrying a man I had only met that month, and what was I doing anyway?"

But time is a healer. They married the following September, live in Paris and have a son.

We take you now from Paris to the Steel Valley School District in western Pennsylvania. Michael Bujdos, then a first-grade teacher at Barrett Elementary, called Jean Kabo, his high school sweetheart from Serra Catholic High in McKeesport. "Jean," he said, "I'm having some volunteers come in to read stories to the class. Would you like to help me out?"

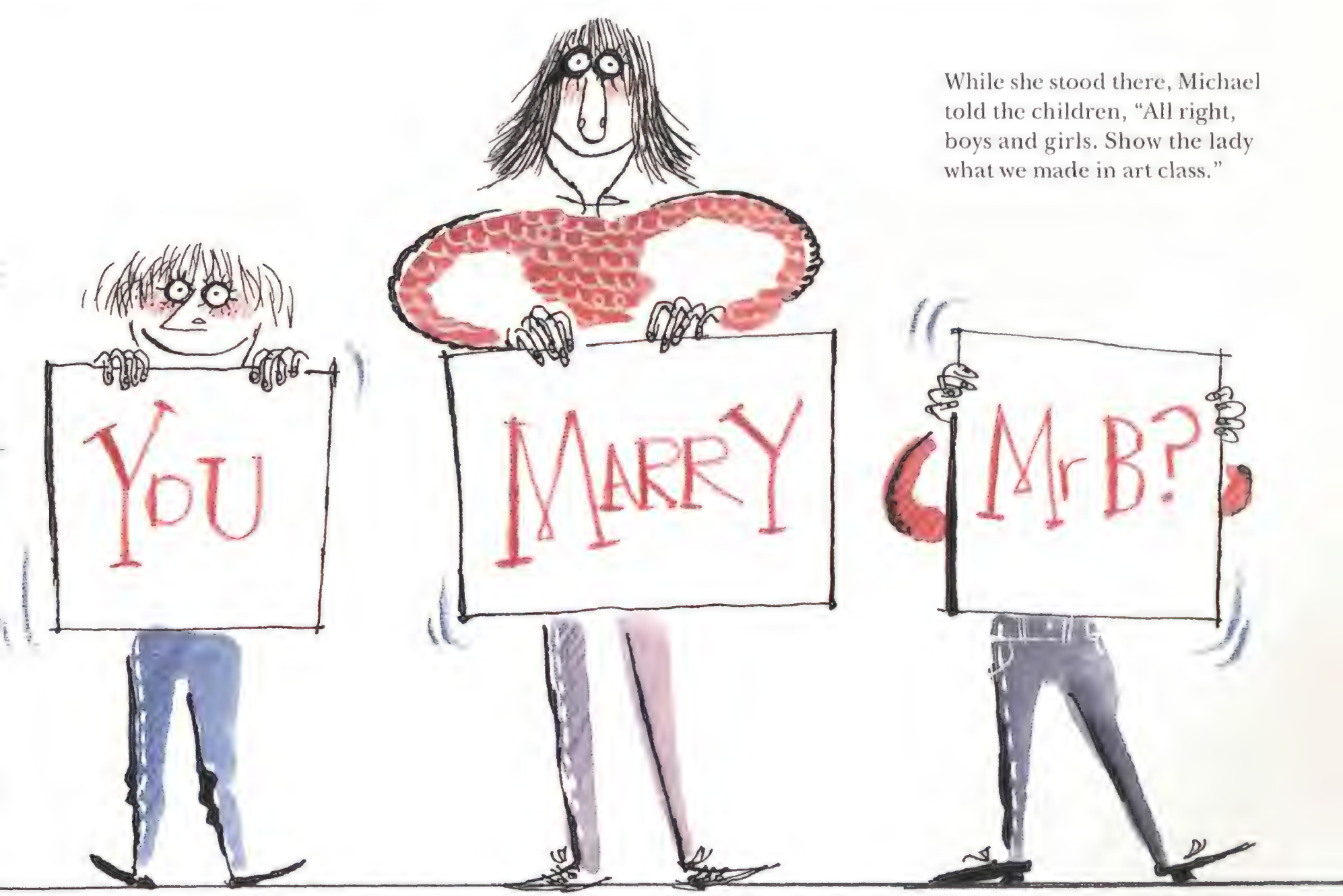
Sure, she replied. When she got to the school, Michael said the kids had an art project they wanted to show her before she read the story. In the classroom, first-graders were lined up at the blackboard with their hands behind them. She thought something was going on, because the kids were awfully serious. But giggling. While she stood there, more than somewhat bemused, Michael told the children, "All right, boys and girls. Show the lady what we made in art class."

At that, the children proudly held up sheets of paper that spelled the words, "Will You Marry Mr. B?"

"I sort of looked at it," she said recently from their home in Munhall, Pennsylvania. "I was in shock. It was really funny. I didn't notice a colleague of his videotaping the whole thing from the back of the room."

For a long moment everyone stood there, the kids watching her, mouths open, Michael holding his breath.

"And I said yes. And the kids loved it. And they were laughing and jumping up and down and shouting, 'She said yes! She said yes! She said yes!'"



While she stood there, Michael told the children, "All right, boys and girls. Show the lady what we made in art class."

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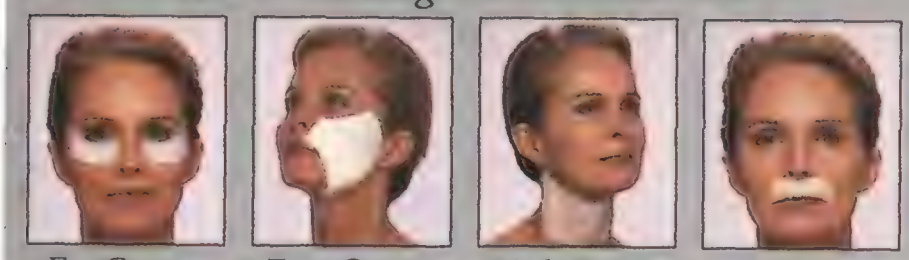

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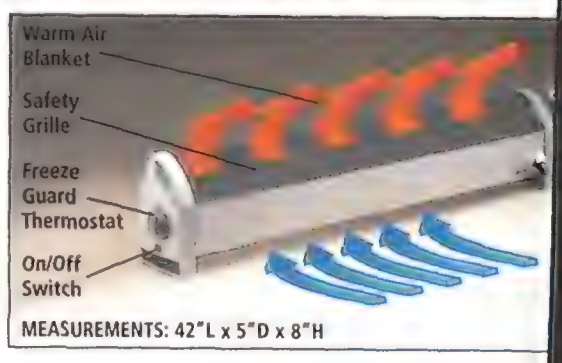

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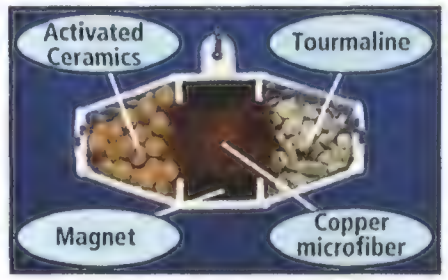

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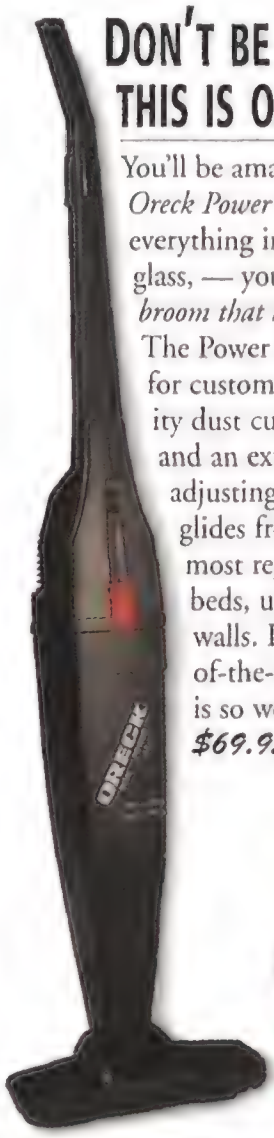

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By Richard Conniff

You can call him 'cute' or you can call him 'hungry'

The much-maligned weasel is always on the lookout for something to eat, and the rest of us should be grateful he usually finds it

One Sunday not long ago, at the height of the English autumn, I went out walking with a researcher named Carolyn King in Wytham Wood, on a hill overlooking the domes and spires of Oxford University. We took a path known as The Singing Way, once a pilgrim route to the convent of a Saxon holy woman. Ahead was Great Wood, where Oxford field researchers have been studying wildlife ecology for 50 years. Behind was Marley Wood, where King did her doctoral research on the secret lives of weasels.

The scene felt like the setting for one of those classic animal tales of the English countryside. King, a slim, forward-leaning woman in her 50s, with an amiable grin turning up the right corner of her mouth, pointed out the badger paths crossing our trail and the places where she tried to figure out, with the help of live traps, what the weasels were up to as they darted about "like small bolts of brown lightning."

She indicated the rusty bracken on either side of the trail, the rodent holes among the roots, and the gnarled and regal old oaks overhead. "I love the thought of the animals living their private lives under all this stuff, and occasionally we come in and ask questions," she said. The questions King asked, first at Oxford, and more recently as a researcher and instructor at Waikato University in New Zealand, had to do with what the weasels were eating, where they traveled and how they managed to survive in a cold and hostile world despite having short fur, little fat and the metabolism of a hip-hop dancer on a caffeine bender.

"It's just too bad we have to trap them to answer the questions," said King, who was back at Oxford on a yearlong sabbatical. "I used to fantasize about learning their language and sending a message around with the robins, and the weasels would all gather together and say, 'Look, we've got a few questions to answer . . .' But then I don't know how you would write a thesis on the basis of that methodology."

"There is something enormously satisfactory about a weasel," King writes in her book, *The Natural History of Weasels and Stoats.* But you would not have a clue what she means from our popular culture. In most animal stories, weasels are the archfiends—"bloodthirsty villains" laying waste to the "poor faithful creatures" of Toad Hall in Kenneth Grahame's *The Wind in The Willows,* for instance, and cutthroat soldiers in "the weasel army of Feragho the Assassin" in *Salamandastron,* a novel in the Redwall series by British writer Brian Jacques. Human references to weasels are commonplace and almost never flattering, not when Washington Irving wrote about a "meagre, weazel-faced Frenchman" nor when David Letterman imagined George Washington's secret opinion that Ben Franklin was a "fat, kite-flying weasel."

Weasels are too quick for most people ever to have seen one in the wild, and zoos rarely display them. Yet

Opposite: The epitome of alertness, a least weasel pokes head out of a tree hollow. Carolyn King, at right, has been studying weasels for nearly 30 years.

they have entered our language as emblems of conniving dishonesty (all publishers are "thieving weasels," according to radio personality Don Imus), selfishness (replacement players in the major league baseball strike were "self-deluding weasels taking advantage of another man's suffering," said an ESPN announcer) and cowardice ("gutless weasels" has become a standard epithet, and Calvin, the cartoon hero, once told his friend Hobbes that the middle ground is for "sissy weasels").

The weasel was once associated with the gentry. Its fur, which turns white in winter and is known as ermine, provided the luxurious trim for courtly robes. But even this only brought the weasel death, not glory; King quotes a bit of "anonymous doggerel" suggesting that it was entirely appropriate for the ermine ("rhymes with vermin"), a "bloodthirsty, vicious, detestable crook," to adorn "the judge, the dowager, the duke." Nowadays, the ermine trade is much reduced in scale. But "weasel" lives on as a synonym for that subspecies of Hollywood gentry, the entertainment industry executive, conjuring up a whole host of smarmy tassel-shoe traits (as when the *Washington Post* recently wrote about "shifty, gutless vacillating network 'weasels'").

Carolyn King calls such slurs character assassination. "Weasels are beautiful animals, and I get quietly annoyed when people malign them. Human traits get projected onto an animal for no reason, the same way people think of foxes as cunning or owls as wise."

And yet she cannot help pointing out that, far from being gutless, weasels are "bold and confident out of all proportion to their size, and they do not seem to know the rules." According to King, they are one of the few solitary predators capable of taking on prey larger than themselves. A small but zealous weasel once killed 17 rats in 20 minutes. Another was caught in about as dire a circumstance as a furry animal can face when a hawk swooped down to seize the weasel in its talons. Yet as the hawk flapped skyward, its flight suddenly became erratic. A witness watched it tumble from the sky and found the hawk dead on the ground, with the weasel's teeth sunk into the bird's breast. In another case, an eagle managed to avoid being killed by a weasel it had plucked up, but survived with the weasel's bleached skull permanently latched onto its neck.

Not, I admit, that anyone is ever going to make the weasel a hero of song and story. It has too many disconcerting habits—eating bunnies, for instance, and performing the legendary "dance of death" (about which more later). An Irish farmer once told me about being chased down a road late at night by a "blood-sucking"

Weasel pauses (above) over rabbit he has bagged while another, in white winter coat (below), goes after eggs.

Strikingly elongated shape enables a weasel to enter the tunnels of rodents, which make up its primary prey.

stoat (a weasel common in the British Isles) so intent on his jugular that even after he ran into his house and bolted the door, the stoat scrabbled furiously at the windowpane to get at him. Never mind that weasels are physically incapable of sucking blood. Their mythology is beyond the reach of reason. The same farmer told me he once saw a stoat funeral cortege proceeding solemnly atop a stone wall.

But let's at least begin the process of rehabilitation with the scarcest commodity in the weasel-human dialectic, the facts. There are about ten weasel species worldwide, not including the closely related minks, ferrets and polecats. Three of them are abundant in the Northern Hemisphere. Both the short-tailed weasel (*Mustela erminea*, also known as the ermine or stoat) and the least weasel (*M. nivalis*) evolved in the Old World and spread to the New by way of the Bering land bridge. (Humans have also introduced both to New Zealand, where King continued to study them after leaving Oxford in 1972.) The long-tailed weasel (*M. frenata*) evolved in North America and has extended its habitat into South America.

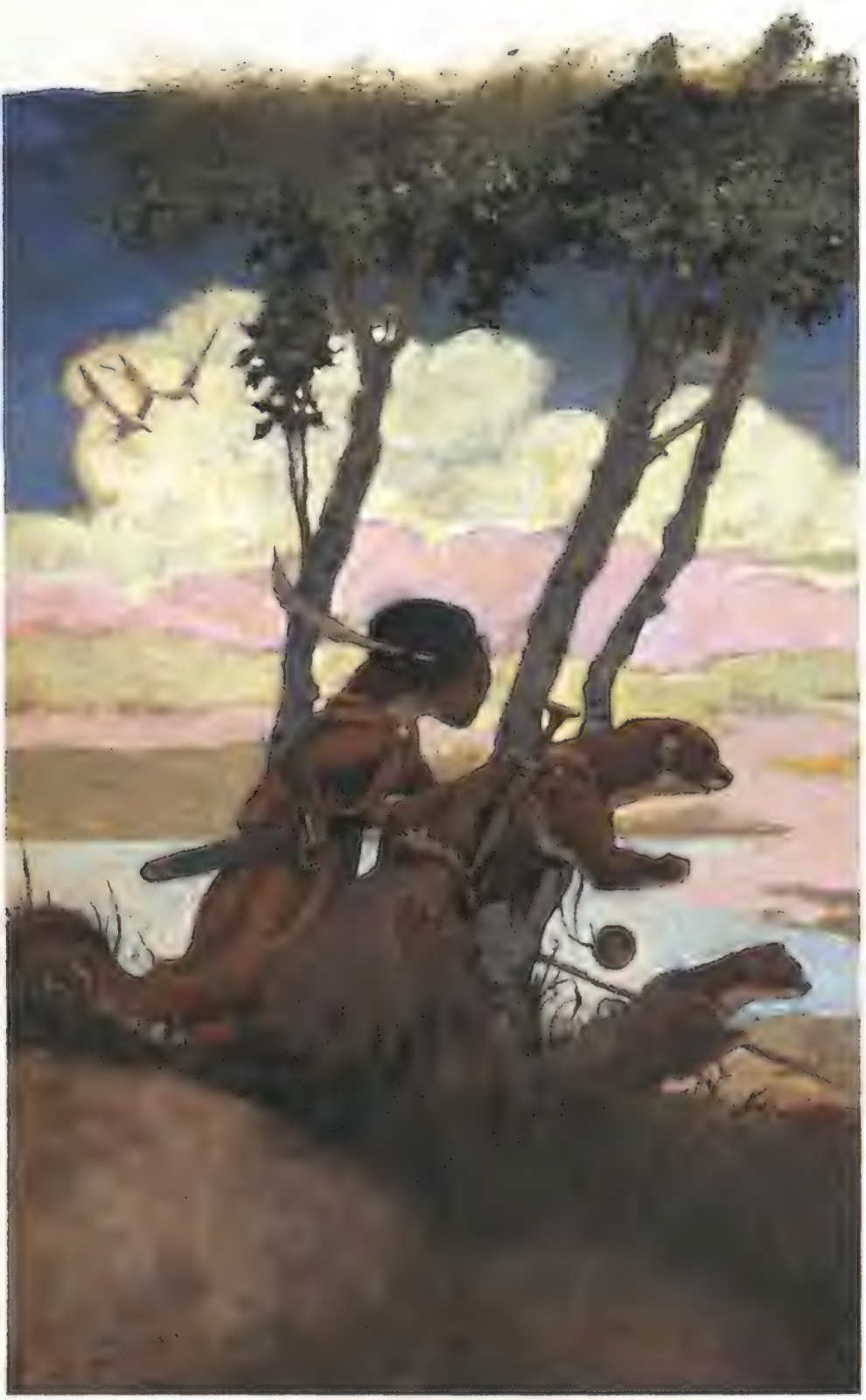
Weasels range in body length from 5 inches (for the diminutive least weasel) to 12 inches and seldom weigh more than 12 ounces. They're blessed with lithe bodies and short legs, the better to enter rodent burrows, and have long, broad, flat skulls, which help them work their powerful jaw muscles on the rodents they find there. They have elongated necks that enable them to tote prey without tripping on their forelegs. Their shape and darting movements are perfectly expressed in the genus name *Mustela*, from the Latin words *mus* and *telos*, meaning "a mouse like a spear."

Everything about the weasel is geared to the killing of rodents. Despite the animal's exaggerated reputation for raiding henhouses and bird nests, the weasels in one study directed 99 percent of their attacks against rodents (among them the rats that are the real henhouse villains). This is the job for which they evolved in the first place, King theorizes, roughly four million years ago in Eurasia. By that time, grasslands had replaced forests during a period of global cooling, and early forms of voles, mice and lemmings proliferated in the new habitat.

Such rodents are the ultimate weasel convenience food, being abundant, nutritious and, as King puts it, "wrapped in a waterproof package." Predators like owls and foxes are held back from these easy pickings by what she calls "the curtain of grass." They cannot pounce until a rodent surfaces from its burrow. The

Weasels have a reputation for raiding henhouses, but they are more apt to hunt the real culprits, rats.

Killing a deer mouse (above) is all in a day's work for a weasel, as is hauling it to a hiding place (below).



Jacket art from the novel *Salamandastron* perpetuates weasels' unsavory image, depicting them as evil soldiers.

ancestor of the weasel, some larger forest mustelid like the modern marten, presumably shared this handicap. But natural selection soon favored a smaller, slinkier mustelid capable of following the rodents down into the underworld: the weasel.

I went out one morning with a graduate student working a line of live traps in the English countryside. A rainbow arched overhead, but as we set out the clouds suddenly darkened and sent a cold, miserable rain pelting down on us. The graduate student carried a plastic bucket of rotting rabbit guts to smear in front of the traps as a lure. We came back after an hour, soaked, stinking and empty-handed. I thought about King's explanation of why weasel behavior is so little known: ". . . scientists are human beings, and they like to be sure of getting interesting and reliable results, preferably in the shortest possible time and without getting wet too often." As a rule, weasels don't oblige.

Would-be predators also seem to find weasels somewhat frustrating. Apart from sheer ferocity, weasels possess a battery of defensive mechanisms. They have been known to play dead. If attacked, they can also unleash a stink bomb (the skunk, another mustelid, is a relative). Like their own prey, weasels are generally hidden by the curtain of grass from foxes, owls and other predators. Even when they hunt in the open, they seem to be acutely aware of the underworld beneath their feet. King once released a weasel and watched it race ten yards straight to the nearest mole hole, as if this escape route were already mapped out in its head.

Weasels also employ camouflage and diversionary tactics for hunting in the open. In northern areas, they turn white in winter to blend in with the snow. Oddly, though, the tails of stoats and long-tailed weasels remain prominently black-tipped. But this, too, turns out to be a defensive mechanism, as demonstrated in an ingenious experiment by Roger Powell, now a zoologist at North Carolina State University. As a graduate student in Chicago, Powell trained hawks to chase model long-tailed weasels wrapped in fake white fur. Using a pulley, he raced the models across a white-painted roof. The hawks, on loose tethers, attacked the all-white weasels with ease. But when Powell used similar models with black-tipped tails, the hawks hesitated for a crucial moment, as if confused, or directed their attacks at the tail tip rather than at the vital organs. Those "weasels" escaped, and the black tail tip was thus established in science as a device to deflect any predator dumb enough to attack a weasel in the first place.

Out in the fields the next morning, a hawk soared overhead as I set out with the graduate student in search of a radio-collared stoat. "It'd be interesting if the hawk came after your stoat," I said, hopefully. The graduate student, who knew exactly how hard it is to get a radio-collar on a stoat, looked at me as if I were mad. "I'd

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Stoat's white underbelly gleams in the sunlight as the creature investigates a nest in a tree. Black tip on tail is another characteristic marking. All weasels are good tree climbers, especially if there's a meal in it.

rugby-tackle it," he replied. (Sadly, the graduate student must go nameless here because live-trapping, radio-collaring and rugby-tackling can all rouse the ire of England's animal rights activists.) For the next two hours, he swept his antenna across fields, meadows and drainage ditches without success. Just as we were giving up, he cried out, "I've got it," then passed me the earphones to hear the steady signal of the stoat. She was resting out of sight in a scrubby patch of thistle.

We sat down to wait, and the graduate student allowed that he liked weasels partly because of their bad reputation. Other predators such as badgers and otters, once also regarded as vermin, are now sanctified in children's literature. But weasels "are still the little skinheads, the little lager-lout thugs." He paused. "They're very charismatic creatures. Or maybe the word is 'enigmatic.' When you look at a weasel, what strikes you is how intelligent they are, really looking at you carefully. They're very curious, investigative creatures."

Suddenly, the stoat appeared, bounding zigzag across the grass to a drainage ditch. We held back a moment to keep out of sight, then followed her 150 yards to a meadow, where she immediately began to hunt. Her black-tipped tail flicked from one spot to another in the ankle-high grass. The radio signal went dead one moment as the stoat disappeared down a burrow, then blipped back again a moment later as she resurfaced. She stood on her hind legs, brown and sleek, showing her creamy white underbelly. Her long snakelike head pivoted from side to side, frantically scanning the grass to see if she'd stirred up any movement. She leaned forward, as if about to dart at something, then leaped right, and left, and disappeared again, popping up a moment later, ten yards away. The grass was spangled with dew, and cows breathed ponderous clouds of steam around their grass-hung mouths. Meanwhile, the mad dog of tunnel warfare was crying "havoc" underfoot. "I bet she's scaring the crap out of the voles," the graduate student whispered.

There was nothing remotely stealthy about her technique. She appeared to be both manic and systematic, demented and yet thorough, qualities that have also been ascribed to the reputed "dance of death," in which the weasel spins and somersaults like a lunatic, causing birds to gawk and draw close. At the height of the dance, the weasel, suddenly sane, darts out and puts a death

Richard Conniff has written most recently about scientific names and Uncle Sam's auctions. His new book, Spineless Wonders, *is about invertebrates.*

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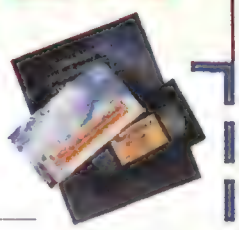

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Huddled in a tree, creature keeps an eye peeled for something tasty. Weasels often use burrows of prey.

lock on the neck of the nearest member of the audience. Stoats are also believed to mesmerize rabbits into submission with their musky scent. The stoat may not have enough strength in its upper jaw to penetrate the rabbit's skull and meet the lower canines coming up from the throat, but the rabbit, squealing pitifully, usually dies anyway, of fright. When we left, our stoat was still frantically hunting, and overhead, the hawk was wisely looking elsewhere.

Out at Wytham Wood, Carolyn King was telling me about a return visit to Oxford after being away in New Zealand for 20 years. At the door to the zoology building, a graduate student asked her to identify herself and, on hearing King's name, exclaimed, "You're the one who persuaded the university to pay for a pony as your research vehicle!"

King had, in fact, entered university legend as a young graduate student by offering to give up her share in the zoology department's Land Rover in exchange for a pony to run her weasel trapline. "You could buy it for £100, run it on grass and sell it after three years for the same £100," she argued, with irresistible logic. "Tell me a Land Rover you can do that with." Thus Oxford acquired an old riding-school pony named Jenny, which carried King out every morning in Wytham Wood to check her 2½-mile-long line of live traps.

"As well as having a companion I could talk to, which was very important, Jenny was helpful," King recalled. "I had to anesthetize the weasels I caught, and vaporization of the ether was much slower in cold weather. So I carried the ether in Jenny's saddlebag, which had the advantage of keeping it warm. I remember one terribly raw day, my fingers were so cold I couldn't write. I had to go warm my hands under Jenny's mane. Now, OK, a Land Rover you might have heat in, but Jenny was companionable. She never minded if I warmed my hands under her mane. She was a very lovely animal." The two of them out on The Singing Way, under a huge old chestnut in the morning sun, were surely one of the most lyrical sights in all of weasel research.

King anesthetized any weasel she caught so she could identify it, take its weight, collect fleas and scats, and send it off again two minutes later, all without being bitten. Considering the weasel's strategy of latching onto victims unto death and beyond, anesthesia seemed prudent. King told me about one dubious theory on how to get a biting weasel to let go of your finger: "You hold up another finger and wave it in front of the animal's face. Then, when it lets go of one finger to grab the other, you pull both fingers back. Quickly."

King was lucky enough to conduct her study during a boom in the local weasel population, and in the end she had 37 of the creatures tagged, most with multiple recaptures. She baited her traps with white mice, which the weasels came to prize. She sometimes released a weasel from one of the first traps of the day only to have it turn up a half-hour later in a trap near the end of the line, perhaps 400 yards away.

Even a mouse can be dangerous

From her studies, King came to see that weasels are not, in truth, little ghouls, any more than they are cowardly or conniving. They are merely carnivores struggling to get by in a world that is at least as perilous for them as for their victims. For example, dissections of weasels commonly reveal masses of bright red parasitic worms packed into tiny cavities within the bone behind the eyes, causing pressure on the brain. King wonders if the "dance of death," seemingly a strategy to lure curious birds, might not be merely a response to an intensely annoying parasite. When a weasel's victim is a rabbit, it may outweigh the weasel by two or three times. A rabbit that has not been "stoated," meaning terrified or mesmerized into immobility, can kick a weasel to death. Indeed, even the hunting of mice and voles can be hazardous; their bites can incapacitate a weasel for days.

The weasel's evolutionary forebears made enormous trade-offs in downsizing to hunt rodents. "The smaller you are, the shorter your lifespan," says King. "All mammals large and small average roughly the same number

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by J. Emerson Brown

Fat! Everyone hates it. Everyone has it, but some people have more than others. Fat cells, which burn very slowly, are nature's way of sustaining us during periods when food is scarce. But times have change—we're pretty well fed these days. It shows around my waist, and it probably shows around yours, too. No wonder health professionals recommend that men maintain an ideal level of no more than 23% body fat and women a level of 27%.

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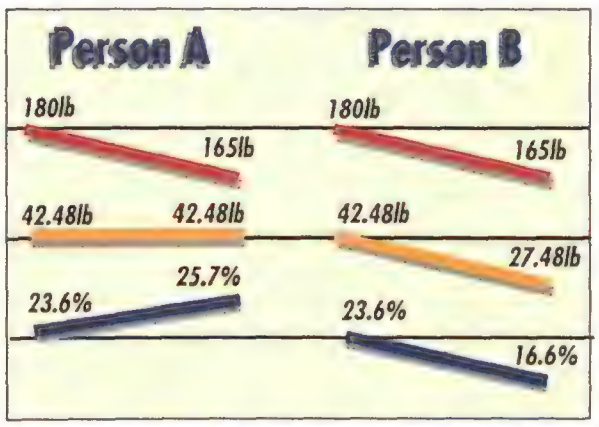

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Baby long-tailed weasels take it easy on a brush pile in Montana. Long-tails appear only in the New World.

of heartbeats and breaths in their lives—and these processes are much faster in smaller animals. I once held an anesthetized weasel to my ear, and its heart was running like a little sewing machine: *dididididididid.*" The pulse of a least weasel at rest gallops at 400 to 500 beats a minute, King said, a stoat's at just under 400. To supply this hopped-up metabolism, the weasel must eat five to ten meals a day, totaling as much as 35 percent of its own body weight.

It cannot afford to miss many meals, because its subterranean hunting grounds make it impractical for the weasel to carry stored energy in the form of body fat. But it also cannot afford to spend a lot of time wandering around looking for something to eat. The small, svelte body shape that is perfect for entering rodent burrows is also the worst possible design for retaining heat. Unlike most small mammals, the stretched-out weasel cannot even ball itself up to conserve warmth, and it must keep its fur coat thin even in the dead of winter. Moreover, the weasel has no snug little home of its own in which to escape what King calls "the infinite heat sink of the clear night sky." Finally, contrary to biological theory and plain common sense, weasels actually tend to get smaller, not larger, the farther north they live—and thus even less energy-efficient. It sounds like a recipe for evolutionary suicide.

But weasels thrive or fail on the perilous edge of right-sizing. A weasel can afford to be small only because the runways down which it is thus able to travel usually lead straight to something juicy. Likewise, it needs no permanent home because it can invite itself so easily into Mouse House and Vole Hole, then snuggle up after dinner in the grassy bed of its suddenly departed host. Being even smaller in the north makes sense so the animal can spend the winter traveling down tunnels and burrows in the sheltered world under the snow. Milder winters in the south allow a slightly larger weasel to step out occasionally for a bit of rabbit or other large game. Everything depends on being just the right size.

The weakness in the system is if there suddenly aren't any rodents at the end of the tunnel. When rodent populations go bust, which may be as often as every winter, weasel populations do, too. To adapt to this extremely unstable way of life, weasels have evolved unusual reproductive strategies.

In the wild, least weasels typically live no more than a year, but a female can give birth and rear her litter to maturity in as little as three months. Unlike any other carnivore, she may then go on, in a good year, to produce a second litter. She can also vary the size of a litter, from zero to 8 offspring, depending on what there is to eat. Her daughters, born in spring, can also produce litters of their own in summer. Thus, under ideal conditions, one female weasel in spring can yield 30 weasels by early fall. Then comes the inevitable rodent crash of winter, which can cause the weasel population to die back as fast as it has blossomed.

The strategy of the stoat and the long-tailed weasel, by contrast, sounds distinctly perverse. Stoats have traditionally been sex symbols of a sort in England. A lecherous man was sometimes described as "a bit of a stoat," perhaps by association with the animal's suggestive shape or the frantic, lunging style of a stoat on the hunt. But science now suggests that the association is far more apt than anyone ever suspected.

Reproduction in stoats and long-tailed weasels is complicated by delayed implantation, a phenomenon best known in larger, longer-lived animals like seals and bears. The female gets pregnant in spring, the fertilized eggs then go into a state of suspended animation for perhaps ten months, and birth does not occur until the following spring. Since stoats and long-tailed weasels in the wild live a few years at best, delayed implantation sounds like an enormous waste of time.

King theorizes that the trait is a hand-me-down from the common ancestor of all weasels. Least weasels simply got rid of it as they evolved to take rapid advantage of rodent outbreaks. But stoats and long-tailed weasels stuck with delayed implantation and cleverly turned it into an advantage. To compensate for the slower reproductive time, they developed what King calls the "extraordinary precocity of the juvenile females."

While the adult female is still nursing her litter, the male stoat comes to visit, often bearing gifts of food. Early observers, full of warm animal-story notions about the countryside, thought this was his way to help out

A streamlined shape plus astonishing grace equals a stoat bounding above its grassy world (opposite).

with parenting. But this male is unlikely to be the father of the litter, conceived a year earlier, and he plays no part in child-rearing. The gifts are intended, apparently, to elicit sexual favors. On his visit, the male stoat mates with the mother—and with all of her infant daughters. Adult male long-tails also mate with immature females.

This is one of those instances in which it is best not to apply human values to the natural world. The combination of delayed implantation and female precocity makes sense for stoats and long-tailed weasels. According to King, it means that almost all females are "pregnant"—that is, carrying fertilized eggs—almost all the time. In one study of 500 female stoats, she found only 2 that had not been impregnated. So if the rodent food supply goes bust one winter and there are no male stoats available the following spring, a lone female can still repopulate a habitat with her own offspring.

I said goodbye to Carolyn King and Wytham Wood, and soon after found myself on a road in the northern Midlands, driving past a menagerie of English pubs—the Hungry Horse, the Dandy Cock, the Beehive, the Swan. I was thinking about the strange twists of evolution, and the even stranger human notions about the world that evolution has given us. How odd that we should have heaped so much slander on the back of the weasel, or expended so much murderous effort to get rid of it. Weasels are quirky characters, to be sure, but also a godsend to the countryside, as the bane of crop-raiding voles, rats and other bucktoothed riffraff. They are the lionhearted heroes of our own backyards.

Just then, on a dark curve, I saw a sign outside yet another quiet pub. It depicted a fiddle-playing weasel in a red waistcoat, beating out the time with one foot. The name of the pub was the Waltzing Weasel, and it occurred to me that here perhaps the weasel could take its rightful place not as a creature of children's stories or wild mythology, but as a real animal. Here, if the patrons referred to a Hollywood producer as a "weasel," or a politician as a "stoat," they would mean it, in Carolyn King's words, as "something enormously satisfactory."

I decided to stop in at the Waltzing Weasel for a pint, but as I was passing through the door, a wave of retrograde thinking suddenly washed over me. I had a vision of the bartender with a compact mass of red parasitic worms wriggling behind his eyeballs, and of a Sweeney Todd sort of operation, in which, just about the time you get comfortable, the bar stool tips you down the chute into the meat grinder. I spun in my tracks and headed back out onto the road.

Old prejudices die hard. It was good to live in a world with weasels. Even so, I wasn't sure I wanted to have a drink with one.

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By Kenneth Baker

Searching for the window into nature's soul

A new kind of poetry is created when Andy Goldsworthy works with stone, wood and water—our world never looks quite the same again

"Might find a couple of good end stones up there," says Andy Goldsworthy, gesturing toward a heap of small boulders perhaps 50 yards off, amid a sloping pasture dotted with sheep and cows.

While other contemporary artists forage for materials at the paint supplier's or the scrap-metal yard, Goldsworthy is more likely to be outdoors gathering dead branches, sorting fallen leaves for those of a certain hue, or winnowing stones. For Goldsworthy frequently improvises his work in the landscape with whatever comes to mind and to hand: flower petals, vines, sand, snow. What results may be as durable as a pinecone-shaped, man-size stack of slate or as delicate and fugitive as a line of elm leaves snaking along the edge of a river (pp. 102-103).

Today, Goldsworthy is searching for stones to use in his current project, *Sheepfolds*, which involves rebuilding, with artful minor changes, traditional drystone enclosures called sheepfolds that have been made and used for many generations in the northern British sheep-farming county of Cumbria. Like small stone corrals, some with gates, some with sheep-high openings called creepholes, sheepfolds serve both as pens and as places where sheep seek shelter on their own from the harsh Lake District winds.

Broken pebbles, twigs, a seaweed-covered rock at low tide—with subtlety, Goldsworthy makes them into art.

While Goldsworthy's original proposal calls for 100 works, *Sheepfolds* project director Steve Chettle explains that "the final number of sites will be determined by the artist, by finance and by agreements to construct works." Begun in 1996 as part of the UK Year of the Visual Arts, the project is not expected to be completed until the year 2000. With components scattered throughout Cumbria, it is one of the most extensive, and least intrusive, public art projects in the world. Many of its elements involve rebuilding structures that have stood derelict for years and will be sited in remote spots where only the most determined visitors are likely to see them. The project stretches so far into the future that no firm estimate of its cost is possible. But it received a substantial boost in mid-1996 with the award of a cultural grant provided by the British National Lottery, amounting to £342,000, or about $550,000.

If the forms Goldsworthy's art takes are surprising, so is its broad appeal. People who know his work only from his photographs of it, and may care little about its challenge to sculptural conventions, are as impressed as critics and fellow artists by its plainspoken physical poetry.

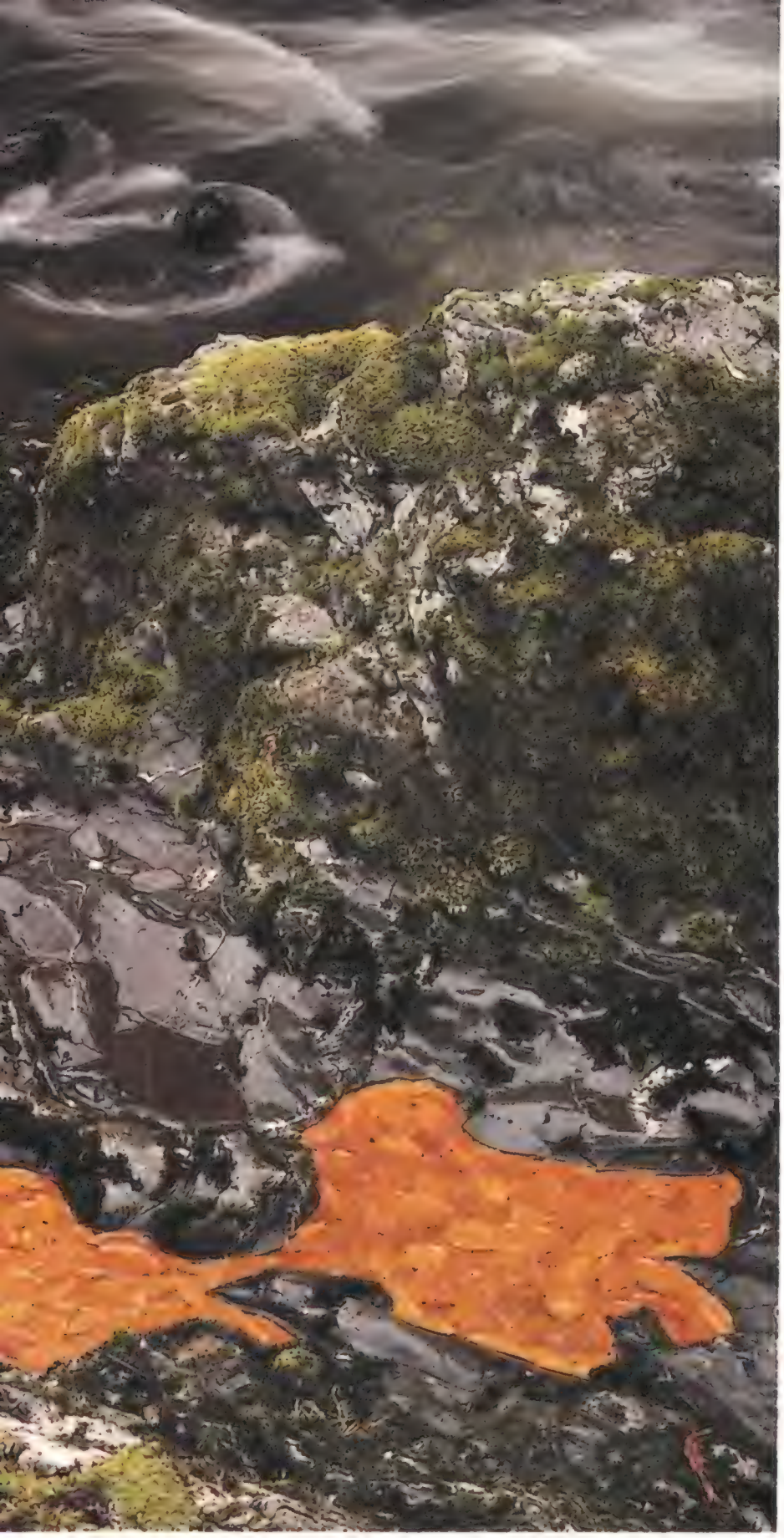
In 1995, when the San Jose Museum of Art gave Goldsworthy his first solo show in an American museum, it turned out to be one of the most popular events in the institution's history. People drove to see it from as far away as Oregon, Wyoming and Texas, according to the show's curator, Peter Gordon. "I know because they would call to check when we were open and then mention that they were planning to drive for 8 or 12 hours to get here from some other state."

The placid elegance of much of Goldsworthy's work often belies the unforeseen difficulties and suspense that its making has entailed. The San Jose exhibition was conceived as a single installation divided into three sections that dealt with wood, earth and stone, respectively. One of the pieces in the show was a chest-high sphere built of interlocked, but otherwise unfastened, manzanita branches. Gordon remembers Goldsworthy entering the gallery the day after the manzanita sphere was built and exclaiming, "Oh! Look what happened!" With a knot in his stomach, Gordon turned to survey the damage, but to his relief he could see nothing changed. Having built the piece, Goldsworthy was so intimate with it that he could see clearly how it had settled itself overnight. He acknowledged, disconcerting the installation crew further, that how his improvised works turn out is as much a surprise to him as to anyone else. About the only sign of tension on Goldsworthy's part, Gordon recalls, was his request to have fly-fishing videos brought to his hotel room each evening to help him unwind. Fishing is about the only purely recreational diversion Goldsworthy permits himself.

The *Sheepfolds* project proceeds at a leisurely pace in comparison with preparations for the San Jose show. Since most of the construction is done by local "wallers," Goldsworthy is free to handle other tasks, such as searching for stones to serve particular purposes and showing around the occasional visitor, like me.

Goldsworthy parks his battered Land Rover, clambers up a briar-barbed embankment and over the rugged wall that bounds the field, and marches up the slope. The rubble of stone near the center of the field is not unusual, he explains. The Cumbrian terrain is pitted

Kenneth Baker is art critic for the San Francisco Chronicle *and author of* Minimalism *(1989), which will be reissued this year by Abbeville Press.*



In *Beech leaves* (left) and *River ice/frozen to the shadow sides of a rock/becoming warmer/shedding the ice* (above) Goldsworthy works in true partnership with nature.

with stones large and small, deposited by glaciers thousands of years ago. As farmers turn up stones, they throw the smaller ones into piles for eventual use in building or repairing the ubiquitous unmortared walls that demarcate property, confine livestock and simply serve to keep unwanted stone out of the way. Hundreds of miles of walls crisscross Cumbria, forming, in Goldsworthy's view, "one of the great earthworks of the world."

Explaining their inherent interest to him as a sculptor, Goldsworthy says, "Walls are physically the expression of movement in stone, the way the stones are taken from one place to another, the way they actually settle in place over time." He views much of his work outdoors as ongoing studies of the energy—both manifest and hidden—of natural elements such as stone, water, vegetation and light.

"The ephemeral work that I do is a form of experimentation," Goldsworthy explains. "Often I go out and don't have any idea what I'm going to do. So I tend not to use tools, because I don't know what I'm going to make, and I do love using my hands. But I've been working like this for 20 years, so every day I've gone out I've learned a little more about the materials, the places they come from." When he makes things to stay, he emphasizes, "I have to feel that they're going to be right for the place, and I take that responsibility very seriously."

The few sheep nearby scatter as Goldsworthy nimbly climbs and pokes among the loose, piled-up stones, dislodging one here and there with a clatter that gets the attention of two torpid, onlooking cows. "This may be a ruin," he says, pointing to a right-angled row, perhaps the corner of a hut wall, barely discernible at the bottom layer of rubble. "Possibly there was an old structure here and it just collapsed, so the farmer decided to use this spot as a dump," he speculates. "Even a pile of stones has history hidden in it."

Goldsworthy is fascinated by the layers of social history

In Dumfriesshire, Scotland, in 1995, Goldsworthy made a spiral—the tree's "soul"—from individual icicles.

in the bucolic Cumbrian landscape. "The fact that someone has walked in a place where I work, has lived in it and died in it, gives what I do its context, its depth," he says. "The fact is that we live our lives on top of other people's. That's why I don't like work that claims a place. That's not the intention."

Parts of the *Sheepfolds* project, if they are to be recognized as art at all, will demand the same sharp eye Goldsworthy exercises when he spots a pattern that might be a remnant of architecture in a tumbledown mound of fieldstones. His sheepfold pieces typically will not announce themselves as art, but by their slight oddity—for example, by enfolding a boulder or a stone cone for no apparent reason, they may give people pause. "When people look into these folds expecting to find a sheep, they find a rock," Goldsworthy writes in his project journal. "I hope this makes people feel something of the energy and movement that I feel is in stone. . . . You could call it the animal in the rock although these are not trying in any way to represent sheep."

Scavenging for materials, Goldsworthy is brisk and purposeful. He is searching for narrow slabs that, built crosswise into a wall, will protrude on both sides and serve as steps to allow people—but not sheep—to climb into and out of a sheepfold, and short blunt elements to flank an open notch at the top of a sheepfold wall to invite entry. He turns a few stones over in his hands and in his mind, decides that nothing here suits his purposes and, unperturbed, strides back down the slope.

Waiting for rain in Central Park

Some of Goldsworthy's creative frustrations go unnoticed because no one recognizes what he is up to, as when he tried to make a "rain shadow" in Manhattan's Central Park—a dry silhouette where his own body keeps rain from hitting the ground. "I lay on a rock for several hours waiting for it to rain, which it never did," he recalls. "That was one of my biggest failures, but no one would have known I was actually failing at a work of art. All they knew was that I was lying on a rock and what's so new about that in Central Park?"

The *Sheepfolds* project raises in several ways the question of where art-making begins and ends. Did it begin with the drawings Goldsworthy made to jog his own thinking about how to work with sheepfolds? The drawings are artful enough in their own terms, even though few correspond exactly to the sculptures' outcome. And what of the fact that most of the work of rebuilding the sheepfolds is being done by hired wallers, not by Goldsworthy himself? The history of art is long on examples of celebrated artists, especially sculptors, collaborating with unsung craftsmen, such as the foundry workers who aid in bronze casting. "The wallers come up with practical solutions that often turn out to be the

most interesting sculpturally," Goldsworthy says. But everyone involved in the project acknowledges that the vision it realizes is Goldsworthy's own. For the visitor who seeks out the project, one of its pleasures will be in discerning the telltale traces of that vision against the background of Cumbrian life and landscape.

In scavenging for forms rather than inventing them, Goldsworthy works in the modern line of "found object" sculpture. But where most artists in this vein adapt manufactured objects, such as the farm machinery parts that American sculptor David Smith built into his work, Goldsworthy finds his prefabricated forms in nature.

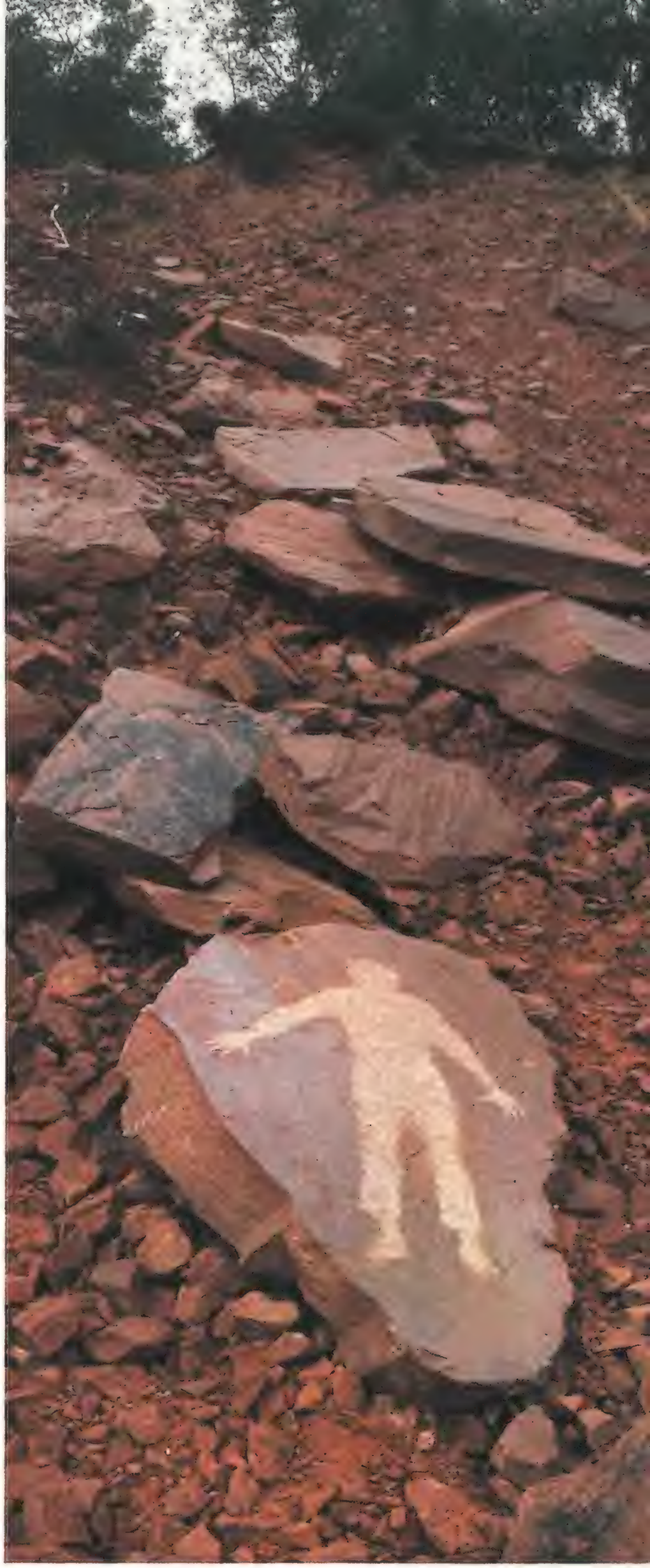
Yet when it comes to extracting large boulders from the ground to place within sheepfolds, Goldsworthy confesses, "It has been very difficult for me to take stones that are so well rooted in a field, even though I know that the taking of surface stones has been part of farming practice for centuries. I wrote once that to take a long standing stone was like uprooting a tooth—it does feel like that."

On the move, but never hurried

Trudging after him through the thick grass up to the rock pile and back, I am amazed how briskly Goldsworthy moves for someone who seems so inwardly unhurried. Despite his patient air, though, he is always mindful of the time, a complex schedule of commitments having allowed only two weeks for his latest stint of work on *Sheepfolds*. This project is Goldsworthy's most ambitious yet in a 20-year career in which he has worked everywhere from gallery spaces in London, New York and San Francisco to the Australian desert, the mountains of Japan and even the North Pole.

Goldsworthy travels as invited and spends from four to seven months each year away from his wife and four children and their home in Penpont, Dumfriesshire, Scotland, just over the border from Cumbria. He has no idea how many miles of travel he averages annually. "I think traveling gives a lopsided perspective on what my work is about," he says. "It gives the impression that I have to go off to other places to work, but it's really the relationship to the common and the ordinary, the things that are around me, the everyday things that are most important to me. When I travel I see different places, I don't see change. Change is really understood by staying in one place."

For this reason, and to spend more time with his family, Goldsworthy is planning to make an art project of staying home for a year and doing all of his work there. "The *365 Days at Penpont* project is something I've been trying to do for a while," he says. "I think the year 2001 to 2002 may be the time to do it. That's really just one of many things I'm doing that are drawing the work closer to home. The *Sheepfolds* project is another. But I've had



Lying on a rock during a shower in 1993, Goldsworthy left his "rain shadow," photographing it before it faded.

In one of the largest public art projects in the world, Goldsworthy is rebuilding 100 sheepfolds in Cumbria, many of them derelict. But he is making some changes, such as the stone cone that he built inside this pen.

to make this year at home into a project to make it fit into the minds of the people I work with."

The family's habit is to take one week's vacation a year, which they spend at a spot on the Scottish coast known as Gatehouse of Fleet. "We rent a cottage," Goldsworthy says, "and during my holiday, I work on the beach. A lot of the most recent work on the beach has been made in anticipation of its inevitable collapse when the sea comes in. That's become a fascination of mine. So that's always very dramatic and the kids just love to watch things collapse as the tide çomes in."

But there will always be offers to travel that he cannot refuse. "If I get an invitation to go north, that's always incredibly seductive," Goldsworthy admits. "The North Pole project that I did was at the ultimate destination of north. It was a way of following winter to its origin. I really like that because I am an artist who likes to work with materials at their source to understand them, and to go to the source of winter was extraordinary and made me understand my home place better."

In 1989, the Fabian Carlsson Gallery in London organized the North Pole project, which Goldsworthy called *Touching North.* It took him to the Northwest Territories of Canada for a month and then, with a pilot, a guide and an assistant, to the North Pole for three days. "I have never had the luxury of constant freezing," Goldsworthy wrote in anticipation of the trip; "so much that I have made in ice has been frustrated by a rise in temperature. I have held ice to ice seemingly for ages waiting for it to freeze only to let go and see it drop off." In the Far North, freezing became effortless.

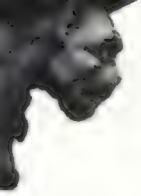
At the North Pole, in April, when the sun never sets but only circles in the sky, Goldsworthy built four circular arches of frozen blocks of snow, two each on perpendicular axes to provide some orientation in the featureless landscape. In his photographs, they give almost a Stonehenge-like impression of being rudimentary astronomical devices. He himself seems to have found these works as haunting as they appear in photographs, for in field notes he wrote that sorting out his feelings about working at the pole "is something that I'll do for the rest of my life."

Although Goldsworthy found it easy to surrender his work to the polar desolation, "I have to say when something does collapse while I'm working on it, I am destroyed," whatever the latitude. "I am never cold in the Arctic while I'm working," he says, "but if something collapses, this intense cold goes right through me, all the heat drains out of me. But I recover from that, and after the event of the collapse I can see, in the overall picture of my work, how important those collapses are."

Lithe and slender at 40, with gray infiltrating his sandy hair and beard, Goldsworthy may be unique among contemporary artists in his knack for working anywhere and everywhere. And as the *Sheepfolds* project proves, this ability is a matter of social skills as well as of a sensitive eye and touch for natural settings and materials. Unlike Goldsworthy's less public work, the *Sheepfolds* project has depended on prolonged and delicate negotiations with landowners and local and county officials.

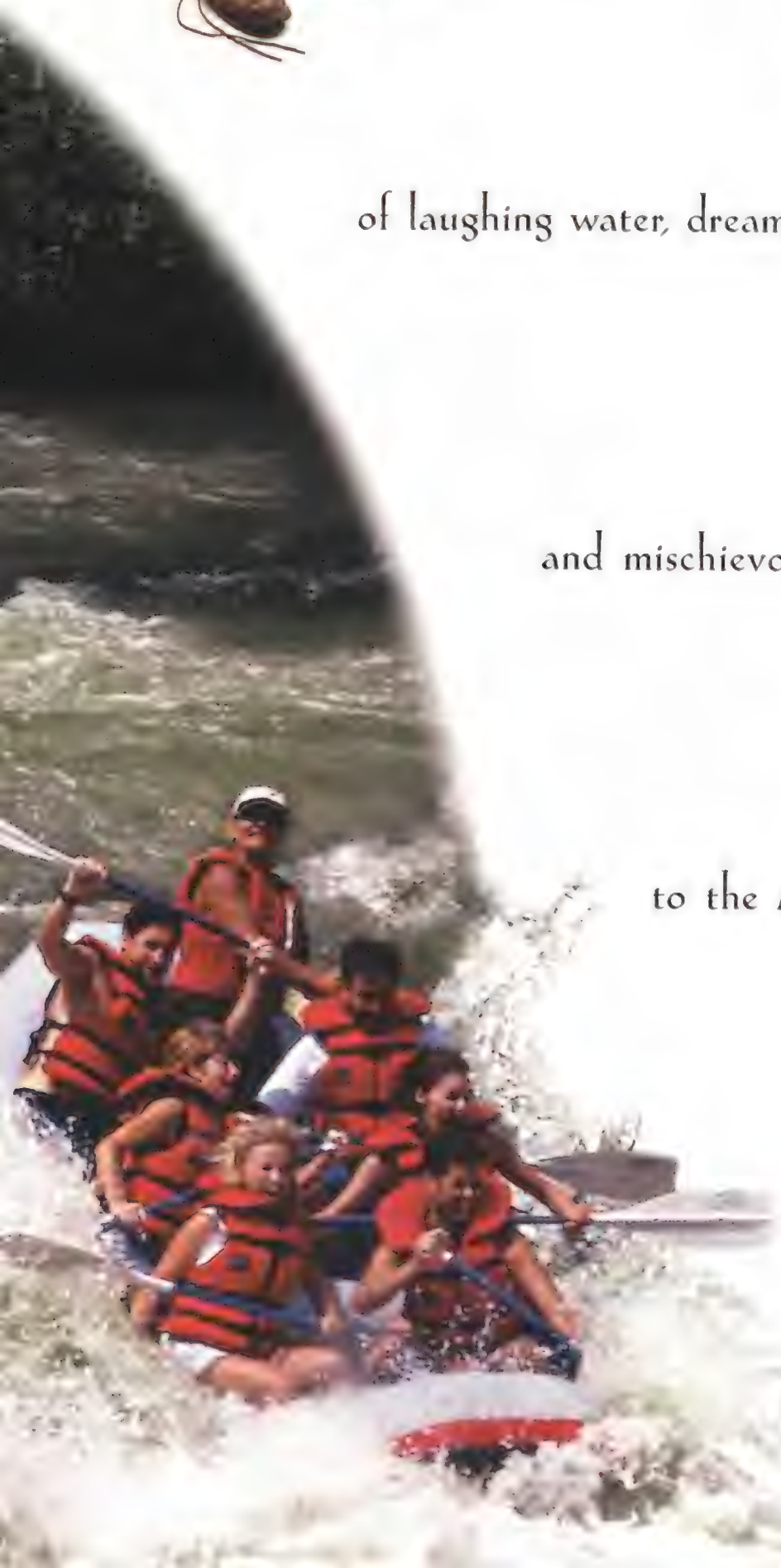
Since most of the sites where Goldsworthy wants to work are on private land, he has chosen derelict sheepfolds more often than not. The offer to repair them at his own expense has won the cooperation of at least some of the sheep farmers on whose property he wants to work. The fact that he employs local wallers—who are typically farmers themselves—to do most of the construction has also been an icebreaker.

Goldsworthy's relationships with the property owners and other townspeople are part of the ongoing con-



I feel the pull

of laughing water, dreaming mountains



and mischievous imps of stone calling me back

to the Mountains of Asheville.

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Elm leaves/stitched together with stalks/ making a line/from tree to river to tree (1994).

structive effort the *Sheepfolds* project entails. "It's very humbling to work here where some people don't want me," Goldsworthy says. "But it's good for an artist to do that, instead of just working on private commissions where people really want you and do everything for you. I'm astonished at the level of enthusiasm, but also at the level of attack, especially when it's stimulated by the *Sun*, the *Mirror* or the *Mail*." He refers to the London tabloids that heaped abuse on the *Sheepfolds* project when it was awarded the National Lottery funding.

But much British media coverage to date has been levelheaded, even favorable, allowing Goldsworthy to voice some of his most persuasive points. "I was brought up outside Leeds, where my father worked at the university," he told a writer for the London *Daily Telegraph*, "and, from the age of about 13, I began working on local farms. And what I did on the farm is where the origins of my art came from and was as important to me as art college as a formative experience."

Goldsworthy's ability to speak to the sheep farmers' concerns and traditions has clearly been crucial. As he restarts the Land Rover, a leathery farmer in a large truck with a trailer behind pulls up and greets him. They exchange pleasantries in an idiom so taciturn and heavily accented that I can barely understand it, and then the farmer speeds off ahead of us. Through the

slats at the back of his trailer, we glimpse a jumble of sheep, which he is apparently transporting from one pasture to another.

"That's how rich men in Cumbria spend their time," Goldsworthy quips, explaining that I have just met one of the wealthiest farmers in the vicinity of Casterton. The fellow is an influential figure locally, and his tacit assent to the *Sheepfolds* project at a parish council meeting was decisive. Asked his opinion of the project at the meeting, Goldsworthy recalls, the farmer replied, "I'm not for it. But I'm not against it," thereby setting a tone of cautious acceptance that seemed to facilitate the project from that point on.

Because so many of his works are ephemeral, Goldsworthy photographs everything he makes. "My approach to the photograph is kept simple, almost routine," he has written. "All work, good and bad, is documented. I use standard film, lenses and no filters. Taking the photograph is not a casual act. . . . There is an intensity about a work at its peak that I hope is expressed in the image. Process and decay are implicit in that moment."

Goldsworthy's reliance on photographs is a link to one of his few direct predecessors, fellow British artist Richard Long. In the late 1960s and early '70s, Long became famous for traveling to isolated places, such as the

Goldsworthy finishes work on a slate arch; he will destroy it, as it is too dangerous to leave standing.

Himalayas, making barely visible alterations in the landscapes he found there and recording them with the camera. But where Long's far-flung work tends toward invisibility and unlocatability, Goldsworthy's often stands in quiet but certain distinction from its setting and, even when ephemeral, is sometimes done in the presence of other people.

Although Goldsworthy admires Long's work, he says he pretty much followed his own path. "I think I've benefited from having no great teacher," he says. "I had good teachers, but no great one. I went to a good art school but not a great art school, Preston Polytechnic in Lancaster. I began working outside within three months of starting there. You know how in art school everybody is working in their cubicles. Every day I went from that to Morecambe, where I had a flat. Morecambe is on the coast and Morecambe Bay is this fantastic flat space that greeted me every day when I got off the train from Lancaster. I was drawn to that space and began working there. David Nash came as a visiting lecturer, and he was very supportive of what I was doing and allayed some of the fears of the staff, and he was later instrumental in my getting exhibitions. If there's anyone I could call a teacher, it's David." Nash, who lives in Wales, is a sculptor whose work exploits the natural qualities of wood, the forms of its growth, how it ages, dries or splits.

The beauty of Goldsworthy's ephemeral pieces is often so self-evident that it silences criticism or makes it seem crushingly irrelevant. Still, his reliance on improvisation and chance almost defiantly raises the question of quality. How then does Goldsworthy recognize his own best work?

"I think the very best works are the ones that could only have been made in one place at that moment and could never be repeated, and they're very rare," he answers without hesitation. "For example, at Christmas [1995] it was very cold, intensely cold, such as we may never see again here. And I made an icicle go round a tree. That is, I reconstructed it from many icicles and it wrapped itself around the tree. And I worked throughout the day on this piece and that's really extremely rare to be able to work in daylight on a piece in ice and have it freeze. That's almost unheard of here. And just as I finished it, the sun, which had been shining all day but not on the place where I was working, illuminated the ice, as if the ice had absorbed the light. And I felt at that moment that I knew what Brancusi must have felt with his 'Birds in Space,' when they caught the light."

People seem to sense the unrepeatable quality of Goldsworthy's work as a mark of artistic authenticity. And it is, particularly in a culture where many artists' works take on the aspect of a product line. But Goldsworthy's art is also collected—especially his photographs—and he sometimes works on commission.

Yet his work never has the air of answering any demand that is not also self-imposed. As an artist, Goldsworthy is not even willing to align himself with what he acknowledges as good causes. People frequently wonder about his position on environmentalism, for example. "Obviously I'm very sympathetic to ecological concerns," he explains, "but I'm instinctively very cautious about being motivated by concerns other than what I can see and feel to be right, for myself, with the land. And I think to be motivated in any way on a political basis would undermine that."

As regards the *Sheepfolds* project, Goldsworthy is similarly free of preservationist animus. "What the project is not about," he insists, "is the sort of nostalgic, rosy view that we want to restore all these sheepfolds because they're so wonderful. It's a contemporary sculptor's need of them that is driving this project. We get some criticism from people who think we should just restore the sheepfolds as they were. And we get some criticism from people who think there's just no need for sheepfolds these days. My argument to both these groups is that I do have a need. We in Britain are so obsessed with how things used to be and that they should be done like that now. But you must have something new in a landscape as well as something old, something that's dying and something that's being born."

Goldsworthy's journal, Alaska, 1995: "I want the line to be made up of wood, ice, wood, ice, wood, ice."

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By Jerry Reedy

Vintage radios by the score

Tucked into an Elgin, Illinois, office building, Ralph Muchow's Historical Radio Museum houses the world's foremost antique collection

As a young boy growing up in Evanston, Illinois, in the 1920s, Ralph Muchow was hooked on a new and transfixing technological advance, the radio. Within a few years, as the golden age of early airwave programming entered its heyday, he and his siblings had become eager devotees of several serials. "My favorite," he recalls, "was *The Shadow*. I would listen to that whenever it was on." Gathered in an upstairs bedroom of their rambling, wood-frame house, the youngsters followed everything from the adventures of Jack Armstrong, the "All-American Boy," to the ongoing escapades of sisters Myrt and Marge.

Much as he enjoyed these features, though, Muchow's real love was the radios themselves—their intriguingly intricate innards, the vacuum tubes and coils and wires. Even as an 8-year-old, he was building crystal sets, advancing to one- and two-tube radios as the sets evolved.

He was, already, an experimenter and an inspired tinkerer. "Every week," he remembers, "one of the Chicago newspapers, the *Daily News*, printed the diagram for a new circuit. It was fun to take apart the radio you had built the previous week and change it to the new one: each was supposed to be better than the last."

Muchow estimates that, over a lifetime, he has built between 200 and 300 radios. "I can," he says, "repair or build any pre-World War II model." Those fix-it skills have certainly come in handy, for Muchow has amassed, over nearly 30 years, the largest private collection of antique radios in the world.

In all, the Elgin, Illinois, dentist owns more than 3,400 vintage radios. All of them are on display in his Historical Radio Museum, where treasures such as a 1902 model built by Thomas E. Clark (the oldest radio in his collection) are crammed into a converted office building. Muchow's stellar acquisitions also include the transmitter and receiver that Adm. Richard E. Byrd carried on his historic 1928 mission to the Antarctic and an ornate console custom-crafted for actor Rudolph Valentino in 1926.

Although Muchow had built crystal sets almost for as long as he can remember, he didn't start collecting radios until 1968. As he walked past an antiques store in Elgin one day, he spotted a couple of old radios in the window. They appeared to have been built in the 1920s. The shopkeeper said the models didn't work. One was an Atwater Kent model 10, mounted on a beautifully lacquered piece of walnut.

Muchow bought the two radios for about $35, took them home and had them working within a matter of days. From that moment he was happily addicted. Every Wednesday, his day off, he'd get into his station wagon and drive from one small town to another, looking for old radios to buy. In one of his earliest quests, he had heard about a farmer who possessed a vintage model for sale. When he arrived at the farmhouse, however, he discovered that the farmer was offering not a radio but a basket full of radio parts—plus an assortment of nuts, bolts, screws and coils of wire.

The farmer wanted $50 for the lot. Muchow offered him $35. As they were haggling, it started to rain. The bushel basket had no cover; Muchow winced as he saw the raindrops splattering on the components. "Neither of us wanted to prolong the bargaining," he recalls, "so we agreed on $40 rather quickly." Muchow hoisted his find into the station wagon and drove off.

As soon as he arrived home, he spread the parts out on the kitchen table and began fitting them together. After several days, he finished his assembly, took a Polaroid shot of the completed project and mailed the image to a fellow radio enthusiast in Pennsylvania for help in identifying his mystery find.

His friend wrote back, stunned. "It was," Muchow recalls, "an Atwater Kent model 5, one of the rarest radios ever made." (Unlike most Atwaters, this model had a defective tuning mechanism; production was suspended, Edsel-fashion, in 1923.) Originally, the AK 5 sold for $55; today it could fetch up to $6,000.

Muchow stashed his earliest acquisitions in his basement. But it wasn't long before the cellar was bursting at the seams. Radios began spreading to other parts of the house, stacked on stairs, piled in the kitchen, heaped in the living room. Finally, his wife, Carole, had enough. "I knew," Muchow laughs, "I had to do something."

That was when he moved his collection to a building he had bought ten years before to house his office quarters. As the leases of tenants there expired, Muchow continued to take over space. Today, all 24 rooms, with the exception of his dental suite, are filled with old radios.

Behind each of these vintage models lies a story, a

Photographs by Henry Groskinsky

footnote to history perhaps, or a tale of how that particular piece was acquired. Take, for instance, the Valentino radio. Actually, the RCA Radiola wasn't ever owned by the matinee idol himself. Although the star placed the order for it, the radio was not delivered to the family until November 1926, three months after Valentino's tragic death at the age of 31. The massive cabinet, containing a state-of-the-art radio and phonograph package, is embellished with an appropriately romantic image: a young couple trysting in a glade. The cabinet also is fitted with a cunning auxiliary drawer. "I like to think," muses Muchow, "that this would have held Rudy's slippers, or maybe his pipe."

The Valentino piece, and many of Muchow's other finds, came into his hands serendipitously. (Through friends, he heard that a Los Angeles art dealer was offering the radio.) The Byrd transmitter and receiver were a gift from the owner of the DuKane Corporation, an Illinois company that manufactures radios and radio parts.

Another valuable acquisition was made possible by a perfect stranger. One day, Muchow's work was interrupted by a telephone call from someone who wanted to sell an Atwater Kent model 70; the dentist told his caller that he already possessed five or six of those. But Muchow's interest was piqued when his persistent correspondent mentioned that the radio "must weigh 500 pounds"; Muchow had never heard of an AK 70 that large. Intrigued, he offered the fellow $50 sight unseen; two friends obligingly hauled the radio to the museum. It turned out to be an AK 70 radio housed in a massive handmade walnut cabinet: current market value is $7,500. The piece features, among other fetching details, a retractable desk (serious listeners would use that surface for writing in a log, a book used to record the call letters of stations picked up) and a handy compartment for stashing liquor. The model had, after all, been produced in 1929, at the height of Prohibition.

Muchow also has a particular affection for the so-called novelty radios, quite the rage in the 1930s. Some of these models feature images of movie stars and celebrities, from Hopalong Cassidy to the Dionne quintuplets. Others, such as his prized Fontana, a 1932 beauty, are probably one of a kind. The Fontana's cabinet is an art-deco extravaganza, replete with fluted columns, a Greek goddess-type figurine set into a circular pool, all illuminated by a flick of the switch. "It was probably made," Muchow theorizes, "for the foyer of a theater or for a men's club. It's not likely that such a piece was created for a home."

Muchow claims that his collecting days are over, that he's no longer about to set off onto the back roads in search of treasures languishing in barns and attics. Maybe so—but his friends would be quick to point out that there is still that station wagon parked out back, ready for a foray into yesterday.

A sampling of Muchow's antique radios

This wireless telephone was manufactured by a Newark, New Jersey, company in 1906.

Atwater Kent 70, built in 1929, offers fine example of cabinetmaker's skills.

Zenith Corporation produced one of first portable radios, with a speaker, around 1924.

Adm. Richard E. Byrd carried this radio set with him on his 1928 Antarctic mission.

Interior of a Scott Philharmonic radio, from 1934, is plated entirely in glistening chrome.

First clock radio, a hand-wound model fitted with an interior crystal set, dates back to 1921.

Novelty radios, 1930s, showcase Hopalong Cassidy, the Official League Ball and Charlie McCarthy.

A 1938 Zenith custom radio was encased inside this cabinet hand-carved by master artisan.

Lavishly appointed 1932 Fontana model was crafted in Irvington, New Jersey.

Crystal-fitted receiver was issued to the German sub fleet during World War I.

This 1940s German radio, made to Nazi specifications, could not pick up distant Allied stations.

Screen idol Rudolph Valentino never lived to see elaborate console he had custom-ordered.

By Richard and Joyce Wolkomir

Where staving off Armageddon is all in a day's work

At the Center for Nonproliferation Studies, scholar-activists are tracking the spread of nuclear fuels—and making a safer world

If a novelist like Tom Clancy were to write a thriller about the Center for Nonproliferation Studies, it might begin like this . . .

Sevmorput Shipyard, Murmansk At 1 A.M. a man slips through a shipyard gate. Sevmorput is a main storage depot for the Russian Navy's nuclear fuel, but the gate is in fact unguarded.

Unseen, the intruder climbs through a hole in the fence enclosing Fuel Storage Area 3-30. He hacksaws the padlock on the building's back door. Then he crowbars the door open.

Inside, he lifts the lid of Container Number 23, packed with VM-4-AM reactor core assemblies. The intruder stuffs parts from three assemblies—containing 4.5 kilograms of enriched uranium—into a bag. Then he hurries back out the shipyard's gate. Twelve hours pass before two patrolling guards notice the storage building's open door.

Monterey, California Funky sardine canneries still stand from John Steinbeck's day. But Monterey has become prosperous, the harbor chockablock with sailboats. On Franklin Street, up a hill from downtown, a bungalow-style building displays a small sign: "Center for Nonproliferation Studies."

Inside the building, computers hum. And shortly after the Murmansk nuclear theft, typing a key word such as "Sevmorput" into one of the computers brings up whatever details Russian authorities know about the heist. From Monterey, the information flashes to the United Nations and the U.S. Atomic Energy Agency. It also goes to other organizations worldwide—subscribers to the center's databases—from Japan's Center for Information on Security Trade Control, and Britain's Foreign and Commonwealth Office, to France's and Italy's ministries of defense.

Seven months after the Sevmorput Shipyard theft, the Monterey center's computers beam out an update: Russian investigators have arrested three men and pieced together the story.

Murmansk It was Alexei Tikhomirov, a 35-year-old Russian Navy captain, who sneaked into the shipyard at 1 A.M. on November 27, 1993. When he left, carrying his bag of highly enriched uranium, a car met him at the gate. It was driven by an accomplice, Oleg Baranov, a former naval officer. Baranov dropped Tikhomirov off at his home, then drove to his own home in the nearby town of Polyarny, where he hid the stolen uranium in his garage.

Six months later, a third conspirator, Alexei Tikhomirov's younger brother, Dmitry, chief of the shipyard's refueling division, confided in a fellow officer. He asked for help selling the stolen uranium, perhaps to organized criminals, or to terrorists, or to a nation with nuclear ambitions, like Iran or Iraq or North Korea.

But the officer resisted easy rubles in a shaky economy. He reported it to the authorities. In late June 1994, Russian agents arrested Baranov and the Tikhomirov brothers and managed to recover the nuclear fuel from the garage.

Monterey It was just one item in the Center for Nonproliferation Studies' constantly updated databases. But the Sevmorput Shipyard theft was chilling. As the chief detective, Mikhail Kulik, special investigator for Russia's Northern Fleet Military Procuracy, put it: "Potatoes are guarded better." Kulik's comment went into the database. So did his warning that security at such former Soviet nuclear sites is feeble. If the burglar had merely bothered to close the storage building's door behind him, said Kulik, the theft "could have been concealed for ten years or longer."

The Sevmorput incident is not the only attempt to smuggle nuclear materials out of the former Soviet Union. The Center for Nonproliferation Studies' databases bristle with cases, like the 1.5 kilograms of highly enriched uranium stolen in Podolsk and the 2.72 kilograms of weapons-grade uranium recovered from the backseat of a parked car in Prague.

Earnest young men and women at the center continually scan journals and news reports and private communications, printed in languages from Armenian to

The center's founder, William Potter, left a teaching post to devote his career to reducing the nuclear threat.

Photographs by Gerry Gropp

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In the Russian naval base city of Severodvinsk, workers dismantle a nuclear sub; security is lax, increasing the risk of nuclear fuels being smuggled out.

Uzbek. They key into the computers whatever clues they find to the spread of nuclear materials, both legal and illegal. And if the atmospherics seem Tom Clancyish, that may be close to the mark.

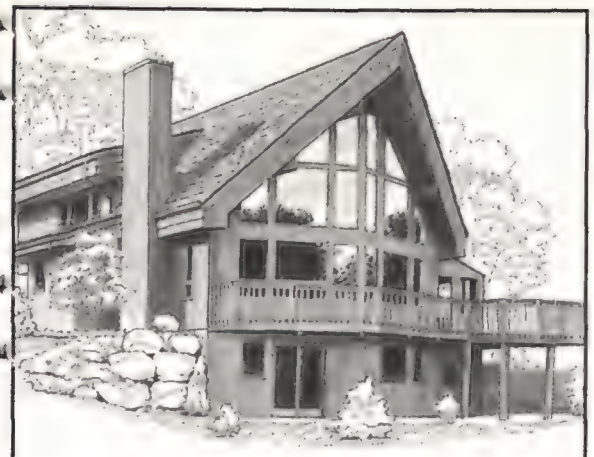
Clancy fans know his recurring hero is a brilliant intelligence analyst, sometime professor and a family man, who averts nuclear Armageddon and terrorist attacks by summoning up screenfuls of beeping computer data. William Potter, who created the Center for Nonproliferation Studies and directs it, matches a lot of that description. True, the Clancy hero's movie version looks like Harrison Ford, while Potter looks more like Bob Dylan. And while the Clancy hero, in the end, usually resorts to shoulder-mounted rocket launchers, it is unlikely that Potter knows which end of a bazooka points forward. Still, the resemblance holds.

Sometimes, for instance, the Clancy hero is summoned by the highest governmental officials to advise on a tense international situation. And right now, as it happens, Bill Potter is just back from Washington himself, after testifying before the Senate's Permanent Subcommittee on Investigations.

The USSR's collapse, he told the Senators, created a handful of economically shaky nuclear powers, including Russia and 14 other newly independent states. They know little about safeguarding their nuclear materials. Even if they did, they are too poor to do much about it. And there are eager buyers—nations with nuclear ambitions and terrorists.

Smugglers can choose from a smorgasbord of nuclear materials, starting with the various isotopes of uranium. To sustain a bomb's chain reaction, natural uranium must be "enriched" with the unstable isotope U-235, becoming "weapons grade." A plutonium isotope, Pu-239, can also make bombs. So can less potent plutonium taken from a nuclear reactor's used fuel rods. Another smuggling opportunity: with such gear as gas centrifuges, a nation can enrich its own uranium.

So far, Potter told the Senators, there have been four confirmed cases of weapons-grade uranium or plutonium smuggled out of former Soviet republics, and three cases in which stolen materials were confiscated before the contraband reached the border. No cases were reported in recent months, he said. But that is probably a false lull: smugglers may now be avoid-



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ing Europe and focusing on the former USSR's weakly guarded southern and eastern borders.

Back in Monterey, Potter tells visitors: "We're not just a paper-producing think tank." But his office belies his words: leaning towers of paper teeter on every table and chair, and on the floor. Visitors must sidle around stacks of journals printed in Ukraine or Kyrgyzstan, printouts from the center's various databases, reports on uranium mining in Uzbekistan and faxes from Minsk.

Actually, the seeming chaos in Potter's office embodies nonproliferation's complexity: the field blends many specialties. Some nonproliferationists are engineers, experts at setting up intrusion detectors and alarms at nuclear plants, for instance. Others are diplomats, perhaps experienced in the intricacies of the Nuclear Non-Proliferation Treaty, which governs which nations can have nuclear weapons and which nations cannot.

At the center, a key activity is spewing out what Potter calls "timely warnings." Subscribers to the center's databases, mainly intelligence services and other government agencies worldwide, can tap into a pool of data on nuclear developments. The center steadily ticks out a stream of updates—a Turkish professor's arrest for selling 2.5 kilograms of Russian uranium to Iranian agents, the dilapidation of the fence around Estonia's 72-acre Saku nuclear waste dump . . .

Just eight years ago, the Center for Nonproliferation Studies was only an idea in Bill Potter's mind. He was then a political science professor at the University of California at Los Angeles, and a specialist on the USSR.

He had chosen his concentration because of a quirk. Potter's international interests started in childhood when his father, a professor at a Midwestern university, took the family to Denmark on a sabbatical. But Potter's focus on

Richard and Joyce Wolkomir are freelance writers who work from their home in the Vermont countryside.

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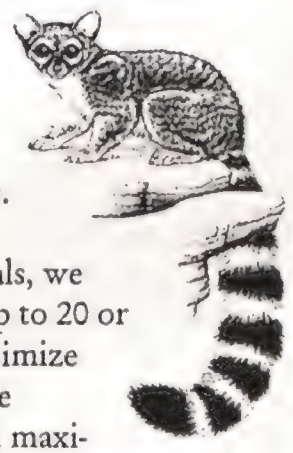

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the former USSR began in 1964, when he was a teenager, visiting an aunt's house. He noticed a samovar and asked his aunt about it. Her answer stunned him. He had been raised a Protestant, with a vague notion his ancestors came from England. But his aunt told him what his parents had never mentioned: his antecedents actually were Jewish Russian immigrants. After that revelation, the region mesmerized him.

His focus on the spread of nuclear weaponry began in 1978, when three of his former students formed a consulting company and hired him to prepare a study on nonproliferation. Data proved spotty. That led him to write a book on the diffusion of nuclear weapons. And then he decided to create an organization to generate data—oceans of it—on the legal and illegal flow of nuclear materials.

Potter found the ideal home for his brainchild at a graduate school, the Monterey Institute of International Studies. The institute's president, retired Army general Robert Gard, remembers the new center began microscopically small.

"In 1989 I'd advertised for a Soviet specialist, and here comes this brilliant kid who looks like a student, with a Harpo Marx haircut," says Gard. "It turns out he and a graduate student had designed a database system, and the center began as a shack in a parking lot, Potter and one student."

But Potter knew exactly what he was doing. The Monterey Institute's students come from 50 countries and speak 60 languages, a mother lode of translation expertise. Potter trained work-study students to comb journals and reports printed in scores of languages, many of them obscure, and to extract relevant data that an untrained eye might miss. For instance, in 1991, at the request of Congress, the center tapped its databases to create a chart showing how Iraq acquired a gas centrifuge, used in enriching uranium. Intelligence agencies had missed this key piece of bomb-making equipment. That was because, as the center's chart graphically indicated, Saddam Hussein had bought the parts—each innocent in itself—from 14 separate firms in five countries: Germany, Britain, France, the United States and Switzerland. Potter had trained his database workers to spot sales of such ostensibly innocuous components.

Graduate students working on the databases get training in how weaponry spreads. Meanwhile, their work-study wages are a fraction of what an agency like the CIA would have to pay. That makes it cheaper for agencies to subscribe to the databases than to amass the information themselves. And Potter believes his databases have an added value: they are not classified.

"We're not an intelligence agency," Potter cautions. "Everything we use is from 'open' sources." He maintains that the center's data on nuclear smuggling often is superior to government classified data precisely because it does come from open sources, such as foreign newspapers, scientific and trade journals, and corporate reports. Potter says such information tends to be ignored by government analysts, who rely almost exclusively on classified material. "Because the center continually monitors so many sources in so many languages," Potter observes, "I am sometimes able to identify cases that government people don't happen to know about yet."

In 1992, for instance, when most government nonproliferation analysts focused on Russia, Potter warned about other former Soviet republics. He cautioned that newly created countries like Georgia, Belarus, Ukraine and Kazakstan had within their porous borders hundreds of kilograms of plutonium and highly enriched uranium, and that their nuclear accounting was so slipshod that they did not even know exactly how much they had. One year later, Potter was proved right. That incident would become known as Project Sapphire.

When the USSR collapsed in December 1991, one of its relics was the massive Ulbinsky Metallurgy Plant, 18 miles outside the city of Ust-Kamenogorsk, in Kazakstan. It had produced fuel for Soviet nuclear submarines. About 600 kilograms of the highly enriched uranium remained at the plant.

Against a backdrop of charts depicting the Russian submarine fleet, Clay Moltz scans Vladivostok papers for news of sub-dismantlement activity.

In 1992, says Potter, Iranian nuclear experts visited Ulbinsky, clearly eyeing its contents.

By mid-1993, Kazakstani officials had decided to rid themselves of the fuel. Information is murky, but they may have offered to sell it to Russia and been turned down. In August 1993, they quietly told U.S. Ambassador William Courtney about the weapons-grade fuel and sought help in getting it out of the country.

To assess the situation, in late February 1994 a nuclear engineer from Oak Ridge's Y-12 Plant flew to Ust-Kamenogorsk. He checked the fuel stored at Ulbinsky and determined it was U-235 enriched to 90 percent—bomb-ready. On March 25, 1994, a team from the U.S. Departments of State and Defense, and the National Security Council, decided to get the material out of Kazakstan. That meant compensating Kazakstan and coordinating with Russia.

To get an answer from Russia, U.S. Vice President Al Gore finally raised the issue with Russian Prime Minister Viktor Chernomyrdin during a state visit in Washington. Ultimately, Russia decided to let the United States take the material.

Fearing news leaks would alert terrorists, the United States pretended the 31 scientists, engineers, physicists, industrial hygienists, packing experts, technicians, physicians and interpreters it sent to the Ulbinsky plant on October 7, 1994, were helping Kazakstan set up U.N.-mandated nuclear safeguards. In fact, armed with 130 tons of airlifted equipment, from a chemical lab to satellite links, they worked 14 hours a day for six weeks, transferring the radioactive material from 1,050 containers into 1,300 steel cans, which they loaded into transport drums. Ultimately, they loaded more nuclear material than Kazakstan knew it had at the site, vindicating the very warning that Potter had given earlier.

At 4 A.M. on November 20, 1994, snow cleared enough for the first U.S. C-5 cargo jet to set down at the Ust-Kamenogorsk airport. A truck convoy then left the Ulbinsky plant on the 18-mile trip to the airport, escorted by Kazakstani special forces. By afternoon the first jet was able to take off, just as the second transport arrived, and a second truck convoy set out from the plant. After flying more than 20 hours, with five airborne refuelings, the two transport planes set down at Dover Air Force Base, in Delaware. The jets' cargoes were then loaded into 12 unmarked, heavily armed tractor-trailers for the trip to the final repository, at Oak Ridge's Y-12 Plant. Later, U.S. Secretary of Defense William Perry noted the Kazakstan shipment had contained enough fuel for 20 nuclear bombs.

Nonproliferation safeguards involve more than clandestine truck convoys.

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Led by Chief Inspector Norbert Reinecke of Germany, a United Nations ballistic missile inspection team completes a day's work in Baghdad, Iraq.

For one thing, since World War II the world has been evolving an intricate web of agreements to keep nuclear weapons from spreading. At last, by 1968, negotiators had completed what is still the world's chief arms-control agreement, the Nuclear Non-Proliferation Treaty. Since then, the USSR has fractured into new countries with nuclear weapons and materials but little nonproliferation expertise. How little—and how much the Center for Nonproliferation Studies has helped to remedy the problem—became clear at a 1995 conference to renegotiate the Nuclear Non-Proliferation Treaty. One former Soviet nation, Kyrgyzstan, was relying so heavily on Bill Potter's advice that it finally made him an official Kyrgyz delegate.

That was a high spot. Daily work at the center is usually more mundane. But if you follow a staff member through a day, you begin to see how many fingers the center has in how many nonproliferation pies.

It is 8:30 A.M. Tim McCarthy climbs out of his dark-green 1994 Mitsubishi GS sports car carrying a silver Starbucks thermos of coffee from home. A senior analyst at the center, he wears a regulation white shirt and a green Ralph Lauren tie. But, despite his executive suit, he looks young to have "senior" in his title.

8:45 A.M. McCarthy downloads his e-mail. Missiles are his specialty, and he has received a Bulgarian newspaper's report on a missile test in the former Soviet Union.

Next he reads a message from the International Institute for Strategic Studies, in London, about a trip he made to Kiev. Ukraine has retooled its Soviet-era missile factories to make space-launch vehicles. McCarthy was part of a delegation advising Ukrainian officials on how to avoid selling their new rockets to countries that secretly intend to fit them with nuclear or biological warheads. Now the mission's organizers seek his help with the final report.

More coffee goes into his cup. He reads a message from the U.S. Department of Energy, with schedules for an upcoming visit to Lawrence Livermore National Laboratory to hear a presentation by a former U.N. nuclear inspector in Iraq. McCarthy is a U.N. inspector himself, regularly flying on assignment to Baghdad in order to help in monitoring Iraqi missile systems.

A friend who works for a defense contractor has e-mailed McCarthy details of U.S. Navy efforts to develop defenses against cruise missiles. It is unclassified data, but hard to get.

9:15 A.M. McCarthy receives a call from the U.N. Special Commission on Iraq, which wants to update him on the situation in Baghdad.

9:30 A.M. Now he studies translated Chinese government documents profiling 200 mainland defense facilities that are converting to civilian production. He analyzes each item, deciding which to include in a new center database on China's nuclear and space industries. Studying an entry on the Jianzhong Chemical Industry Corporation, in Szechwan Province, he notes that a subsidiary, the Yibin Nuclear Fuel Component Factory, makes fuel for nuclear power plants. He marks it.

9:45 A.M. A State Department analyst calls about a study McCarthy is preparing on Middle East missiles.

9:50 A.M. More coffee. McCarthy continues working through the Chinese report.

11 A.M. He talks on the telephone with Rand Corporation analyst Andy Aldrin, astronaut Buzz Aldrin's son, with whom he is collaborating on a database and a book, both of which will survey the former USSR's missile industry.

11:30 A.M. Another call from Lawrence Livermore National Laboratory, this one telling McCarthy where to pick up his access badge when he arrives.

11:45 a.m. The coffee is almost gone. McCarthy works on the database covering the former USSR's missile industry.

12:15 P.M. A coworker calls, asking McCarthy to help brief some of the many dignitaries who regularly arrive at the center.

12:30 P.M. McCarthy writes down observations of his Kiev visit, at the request of the International Institute for Strategic Studies, the organizer.

Then he e-mails an official in the Chinese space industry, expressing interest in a publication the man has described. Traveling in the United

States, the official had read an article McCarthy wrote on China, in *Jane's Intelligence Review*; they began corresponding weekly. The center is giving new attention to China: the official hopes to be his country's first "visiting scholar." The scholars, from countries new to nuclear nonproliferation efforts, are government workers, scientists, diplomats, professors, journalists. They spend several months at the center, sharing information while getting up to date on nonproliferation.

1:15 P.M. McCarthy scans international defense-industry publications, looking for items that should go into the center's databases. He spots a report on a Russia-to-Iraq sale of gyroscopes, used in missiles.

1:30 P.M. Another call from the U.N. Special Commission. Details on his next Baghdad trip.

1:35 P.M. Tamara Robinson arrives for lunch. A petite young woman with long, dark hair, she manages a center database on the environment in the former USSR, where sites like nuclear waste dumps tempt smugglers. But she is also McCarthy's girlfriend.

They spend part of their lunch hour figuring out what to make for dinner and when to leave for the gym, for their evening workout.

Russian missiles (background) are among those tracked by Tim McCarthy.

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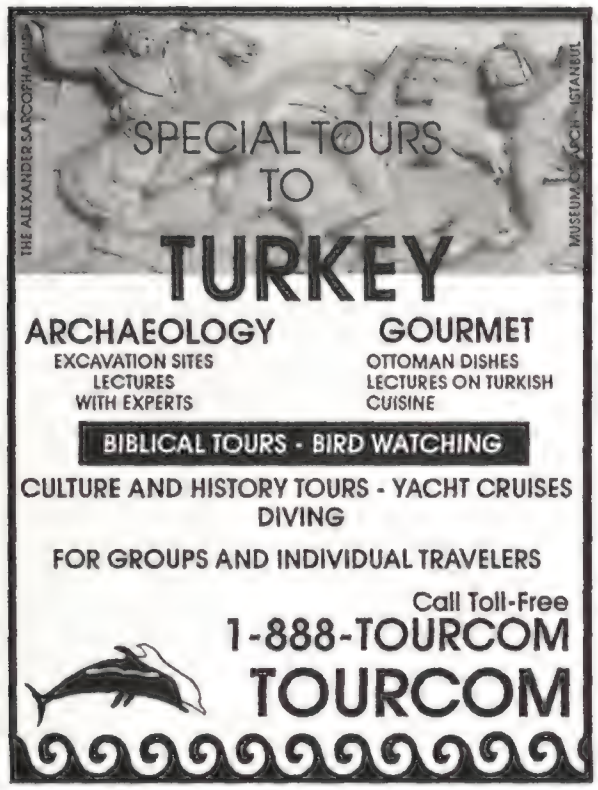

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2:05 P.M. McCarthy conducts a seminar on missiles for two visiting scholars, a chemist from Kazakstan and a physicist from Uzbekistan. The center's aim, with its visiting scholars, is to create a worldwide network of people in key positions who can help their countries safeguard nuclear materials and negotiate arms-control treaties. Today's discussion is about missile engineering and propellant chemicals.

3:30 P.M. McCarthy prepares for the weekly staff meeting.

4:00 P.M. The entire staff of 30 gathers to discuss nuts-and-bolts items, from operating the new photocopier to articles for the next *Nonproliferation Review*, a center publication.

4:45 P.M. McCarthy leaves the meeting to take a telephone call—an East Coast radio station wants to interview him live that evening, on a bombing that day in Saudi Arabia and arms proliferation in the Middle East.

4:50 P.M. He returns to the meeting, now down to the ten senior staff members. They debate the center's focus in upcoming months and discuss new sources for database information. They decide to send scouts to international arms trade shows.

5:30 P.M. McCarthy telephones a missile analyst in New York, networking. They discuss a North Korean missile sale to Egypt.

5:45 P.M. Party time. Three staffers are leaving. McCarthy brought back a bottle of vodka from Ukraine, a donation to the goodbye fete. But the party is a rare chance to catch Bill Potter, and McCarthy talks to him about a missile study he may prepare for the State Department.

7:00 P.M. Back in his office, McCarthy finds e-mail from Bonn. An analyst at a German think thank, the International Center for Conversion, has decided to pay a visit to the center.

7:45 P.M. McCarthy and Tamara Robinson head out for the gym and home to dinner.

10:30 P.M. McCarthy returns to the office to prepare for the interview with the East Coast radio station. Much of

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his work in Baghdad is classified, and he must speak carefully.

11:30 P.M. The radio station calls and the interview begins. Topics range from how the U.N. inspectors keep Iraqis from removing documents at missile sites (by controlling all entry and exit) to discussion of an underground Libyan weapons plant, presumably making chemical or biological weapons to use against Israel.

12:30 A.M. McCarthy finishes the interview and goes home, a five-minute drive. His workday is finally over.

Gathering information as McCarthy has done today, via journals and e-mail and the telephone, is one way the center gets data. But staff members also go out to look for themselves.

Recently, for instance, the center's youthful assistant director, Clay Moltz, flew to the Russian Far East. He went to check on the dismantling and safeguarding of nuclear materials in the region, an effort that is assisted by the United States under the Nunn-Lugar Cooperative Threat Reduction Program. And Moltz had a significant advantage in his information gathering: because he was not a governmental official, he was allowed to travel and speak freely.

It was 12 degrees below zero in Vladivostok when Moltz arrived, and the water was shut off. He crammed into a maroon Honda with three Russian academics and another American and set off to interview officials in a region lined with decaying naval bases of the Pacific fleet and overrun with gangsters. These once-secret military cities with their great naval bases—Bolshoi Kamen, Chasma Bay, Pavlovsk Bay, Shkotovo-17—were ominous names during the Cold War.

At Bolshoi Kamen, where Moltz interviews a key engineer working on dismantling nuclear submarines, he learns that salaries at the dismantling plant have not been paid in three months. With tax collections dried up, city officials have turned off the boiler that heats most houses and buildings. And so Moltz and the engineer

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In the Gulf War, U.S. troops faced threat of chemical, biological weapons; the center tracks these lethal agents.

find that they must talk in the cold.

There are problems with the huge American equipment—the guillotine shears, for instance, used in taking apart subs—because the machinery requires too much expensive electricity, Moltz learns. And there is the nuclear submarine that caught fire in 1985 during refueling at Chasma Bay and spewed radioactive particles onto coastal towns. It is now simply hitched to a dock because even the exterior of the sub is highly contaminated; nobody knows what to do with it. Meanwhile, the bay where the submarine burned is highly contaminated. People still live there, Moltz learns, but they don't live long.

What struck Moltz as he rode along was how easy it has become to steal the region's materials. Outside one nuclear submarine facility during his visit were 17 North Koreans, supposedly agricultural workers. But they were miles from where they were supposed to be. Why were they snooping around a submarine base with stores of highly enriched uranium? And when he reached Nakhodka he also wondered why, since the area's largest trading

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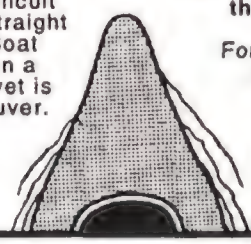

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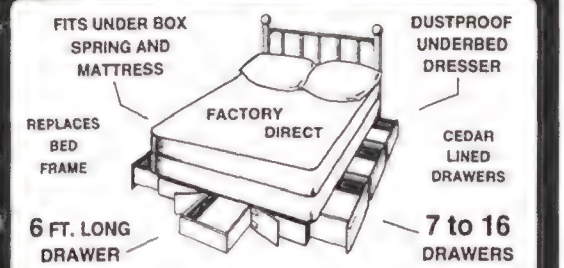

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partner by far is South Korea, it is North Korea that has built a sprawling consulate. He called repeatedly, but nobody at the consulate would answer the telephone.

After he returned to the United States, Moltz was asked to give a briefing to Nunn-Lugar officials in Washington. The Vladivostok region is in such disarray, he reported, that radioactive waste from dismantled submarines is overflowing its storage facilities, contaminating topsoil and seeping into the Sea of Japan. The Vladivostok region's former governor had told him that, without the Nunn-Lugar assistance program, the nuclear submarines probably would be left to rot. Or they would be sunk in the Sea of Japan.

Because he was not a government official, Moltz had an enviable amount of latitude in speaking with his contacts. That flexibility has attracted government nonproliferation experts to the center's staff. One of them, Richard Combs, is a former diplomat who served in the USSR and as an adviser to Senator Sam Nunn. Because it is nongovernmental, he says, the center, freed of bureaucratic restraints, can serve as an effective go-between.

For example, he soon will visit Moscow to explain to Duma staffers the U.S. politics behind the Nunn-Lugar program. Later, he will explain to U.S. Congressional staffers how Russia views the Nunn-Lugar assistance.

Also, the center can quickly adjust to changes. It has just opened an office in Washington, D.C., for instance. And it is now opening links in China, another proliferation problem country. "The former Soviet Union is a piece of cake compared to the Chinese problem," Combs sighs. Meanwhile, he says, nuclear weapons are not the sole post-Cold War danger. "The proliferation crowd is very concerned now with chemical, biological and even conventional weapons—if I were a terrorist, I'd see chemicals and bugs as the poor man's nukes," he says. At the time of the Gulf War, he notes, Iraq had dead-

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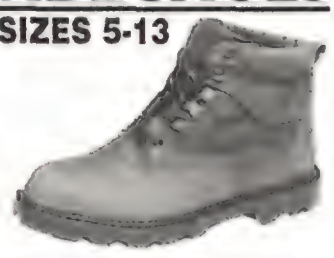

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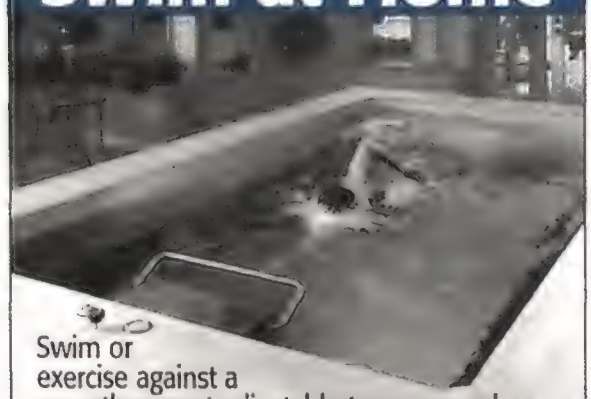

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The center's Jonathan Tucker was U.N. biological weapons inspector in Iraq.

ly chemical agents deployed in warheads. And, Combs says, the CIA was unaware of Japan's Aum Shinri-kyo cult until the group was accused of releasing sarin nerve gas in a Tokyo subway station in March 1995, killing 12 people and injuring more than 5,000. "The intelligence community doesn't have the resources to keep tabs on every kooky group," he observes. "To make sarin, all you need is the right ingredients and a few people with advanced college courses in chemistry."

Jonathan Tucker, an expert on biological and chemical weapons who recently joined the center's staff, says that many raw materials for chemical weapons also have legitimate commercial uses, making them hard to control. "Thiodiglycol, for instance, is used in ballpoint pen inks, but if you mix it with hydrochloric acid you get mustard gas," he says.

Formerly on the staffs of both the Congressional Office of Technology Assessment and the U.S. Arms Control and Disarmament Agency, Tucker moved to the center because he wants to help train nonproliferation specialists in such countries as China and Russia. He says more than 100 countries—plus various terrorist groups—

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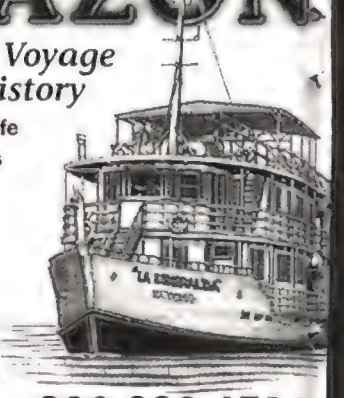

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are now technically capable of manufacturing chemical and biological weapons. He believes enforcement of the 1972 Biological Weapons Convention, the treaty banning these agents, is vital. The solution lies in setting worldwide norms against the use of these weapons.

Even a few kilograms of anthrax bacteria, disseminated into the air above a city, could, he adds, produce as many casualties as a nuclear bomb. "Iraq was a wake-up call," Tucker notes. "We have only recently learned that it had stockpiled thousands of liters of biological agents."

Tucker speaks from experience because, like his colleague Tim McCarthy, he has served as a U.N. biological weapons inspector in Iraq. McCarthy, the center analyst who put in the workday that ended at 12:30 A.M., has completed a number of missions there. The son of a Special Forces colonel, McCarthy had to give up his own military aspirations because of martial arts injuries. But now, in Iraq, on nonproliferation's front lines, he sometimes feels he is in fact in the midst of battle, after all.

When McCarthy and his fellow inspectors land in Baghdad, on a German military plane, a bus takes them to their headquarters at a hotel, where they tell Iraqi officials which sites they will inspect. If the chosen sites are unexpected, the room quickly fills with more Iraqis whose function, McCarthy says, is to "give us stern looks." Sometimes 20 Iraqis will confront the ten U.N. inspectors across a table for 12 hours, the tension escalating to yells and accusations. Eventually, the U.N. team boards its bus and rushes to the chosen site. But by then the Iraqis may have bought time.

Inspections can easily become confrontations as well. Iraqis have physically blocked inspectors from entering certain rooms. In Baghdad, McCarthy has received threatening telephone calls. And the intimidation campaign can go beyond the merely menacing. Not long ago, as two U.N. guards drove

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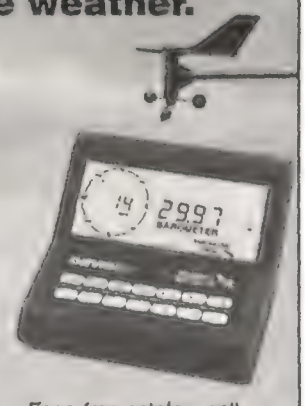
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a truck past a gasoline station, the station exploded. Both guards died. Who did it, and why, is unknown.

"Iraq is every nonproliferation analyst's nightmare come true," says McCarthy. The country had amassed biological weapons, chemical weapons, and was perhaps a year or two from completing an atomic bomb. "Information is the key to stopping this stuff," McCarthy says. Sometimes the information has come from the Center for Nonproliferation Studies.

At 1 A.M. one night in Bahrain, site of a primary U.N. base near Iraq, the inspectors were struggling with an assessment of the Iraqi missile program, which had to be rushed to New York. But they needed to know about transactions between Iraq and another country. Tracking that data through classified intelligence channels would take a long time.

"I can handle that," McCarthy told his teammates, and he dialed the center in Monterey. "They ran a search of the databases, and I had the information in minutes—the same data we would have received from the classified channels, but you didn't need 25 clearances to get it."

It was another coup for the rapidly growing center and its open-source databases. Not long ago, however, Bill Potter flew to Los Angeles for a meeting that he himself has classified top secret. Asked about it, he looks pained. "The problem is that we already get grief from our colleagues in the nonproliferation community because we're out here in California, where everything is supposed to be a little flaky, so I'd prefer to just keep that confidential," he says.

In the spirit of unclassified data, however, let's spill the beans: Potter was meeting with Hollywood producers thinking about turning cases from the center's databases into a television series, or movies. For the Center for Nonproliferation Studies, docudramas warning of post-Cold War nuclear dangers may be the ultimate in open-source information.

As Potter puts it: "You can read Tom Clancy thrillers, but this is real."

Before an image that has defined the 20th century—a diagram of a nuclear chain reaction—Richard Combs ponders the center's nonproliferation mission.

Book Reviews

A Place in Normandy
By Nicholas Kilmer
Henry Holt, $22.50

In 1920, the author's grandfather, Frederick Frieseke, one of the preeminent artists among the group that would come to be called the American Impressionists, purchased a farmhouse hard by the village of Mesnil in Normandy.

Frieseke painted there, capturing the light as he stood in the terraced fields and garden of the property, while his wife managed the day-to-day complexities of a noble, if somewhat dilapidated, manse situated on 50 acres of pasture, thicket and forest.

The American expatriate artist died in 1939 and his widow, Sarah O'Bryan Frieseke, returned to the United States for the rest of her life. When she died in 1966, the family was surprised to find that she had requested to be buried alongside her husband in Mesnil. No one in the family had set foot there for nearly 30 years.

When Sarah's grandson, Nicholas Kilmer, arrived there in the late '60s, a young man with small children, the house stood as a monument to abandonment and neglect. Rot, rack and ruin were the order of the day; the gardens had virtually disappeared. For 30 years, Kilmer, his wife, Julia, and his extended family have attempted, slowly, over summers, to restore the place. His unassuming and eloquent account of that struggle is a testament to constancy; beset by a very limited budget and severely wanting in handyman abilities, the family has done its best to restore the place to some semblance of its 1920s faded gentility. The task has proved an enterprise grounded in equal measures of devotion and foolhardiness.

Julia, ever sensible, sums up the situation: "The damn thing's falling apart." The issue, however, isn't practicality; it's love—abiding affection for a house replete with the ghosts of grandparents, a great and ancient hearth, and a countryside overrun with purple foxglove, apple trees and blackberries, and wild boar and foxes and trilling nightingales. Never mind that the floor has collapsed, indeed disappeared, in the upstairs bathroom, an owl is invading the dining room and the propane water heater is a life-threatening contraption.

It's impossible to survey Kilmer's Sisyphean labors without a nod to those wildly successful paeans to home repair *à la française*, Peter Mayle's *A Year in Provence* and *Toujours Provence*. Let's point out, for starters, that this is no environs of Aix: in Normandy, it rains, it seems, nearly all the time. (One intrepid American friend who visited Kilmer's grandparents there would later describe their dwelling as a "damp, moldy, and wholly colorful farmhouse.") Nor is there money to fix or buy things (Mayle's *grande crise* occurred, his readers will surely remember, when the custom-ordered marble table proved too backbreaking to be carried by a phalanx of laborers into the dining courtyard). Kilmer is instead reduced to lugging a hedge trimmer from his home in Massachusetts, that useful implement being too expensive to purchase from a French shop. He's also willing to admit how bad his French is, finding himself reduced to hapless attempts at pantomime when he does arrive at a French hardware establishment, stymied and bedeviled by his ignorance of the word for screwdriver.

But where Kilmer and Mayle really part company is on the matter of houseguests. Mayle has perfected the sneer on this front: a visitor, by and large, is regarded as the lowliest of interlopers. The Kilmers will welcome you with open arms, whether you are old friends or an acquaintance of some former renters. (In this case, the caller was indeed a stranger, a former D-Day pilot returned to Normandy on the 50th anniversary of the invasion.) Kilmer is just clearing up from one batch of guests, but of course he invites the fellow over for drinks. If one cannot cross that threshold oneself, this book is undoubtedly the next best thing to a room with a view and a glass of calvados.

Kathleen Burke is the editor of SMITHSONIAN "Book Reviews."

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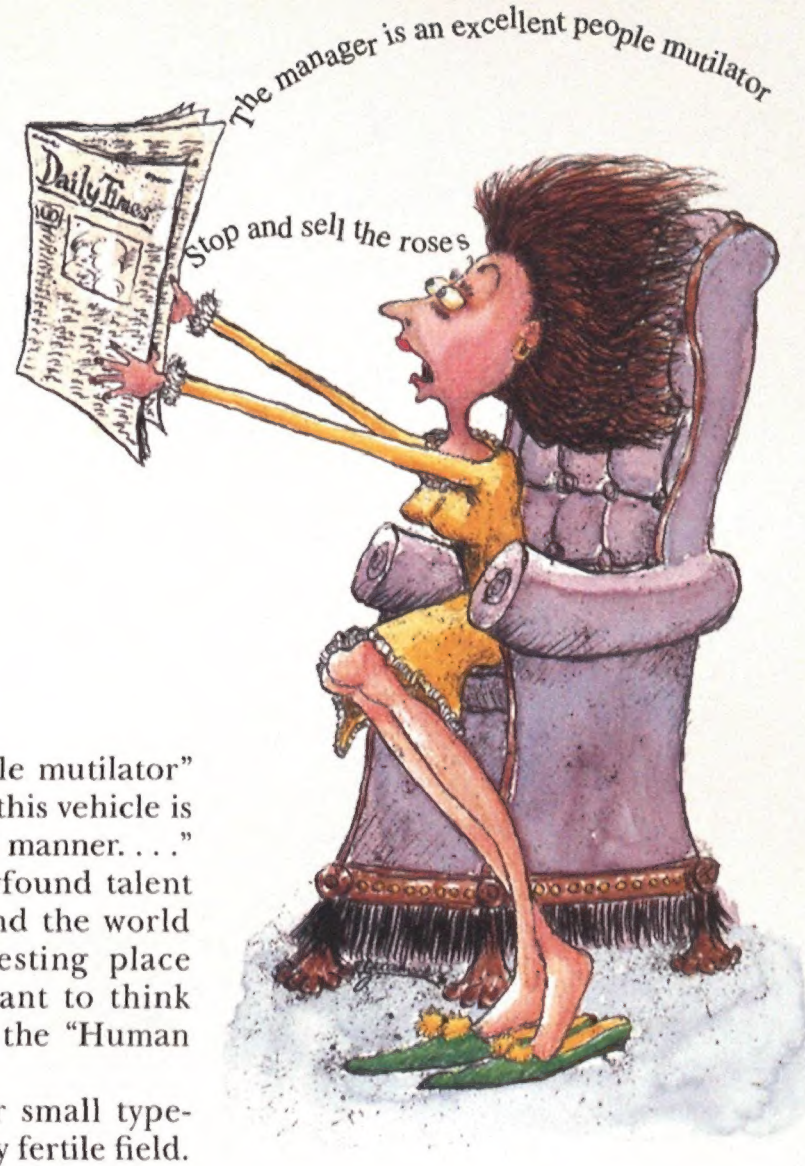
By Frederica Mathewes-Green

Think of all you'd miss if your reading skills weren't 'enhanced' by age



Now that all three of my children are teenagers I've reached the age where, as they keep reminding me, I'm well on my way to being a geezer. Most signs of impending geezerhood involve diminishment: loss of hearing, memory and I think there was another one. The problem I didn't expect was the tricks the eye can play while reading. With increasing frequency, I'm running across astounding things in headlines, billboards and captions—only to find, on closer inspection, that they didn't say that at all.

Take, for example, a recent photograph in SMITHSONIAN. The caption informs me that the plumed avian pair pictured are "non-imaginary birds." That seems accurate enough, if a trifle defensive, and the birds are glaring defiantly into the camera, as if daring the reader to doubt their existence. Oh. "Non-migratory." Never mind.

I may be allowed some leeway on a word that I don't find a use for every day, like "non-migratory." It's a little harder to excuse the misreading of common clichés that have worn ruts in my mind. Whatever possessed me to read a bumper sticker as "Stop and sell the roses"? Why did I immediately picture pajama-clad cult devotees, strolling through airports and urging posies on travelers? Worse, why did this seem to me a reasonable admonition for someone to put on a bumper sticker? "Stop and sell the roses," I thought, vaguely. "OK. Guess they do."

How about a catalog touting a holographic device with the slogan "Absorb your friends!" I dimly and unsuccessfully tried to picture this, before realizing it was really the old familiar "Astound your friends!"

"Candidates Debate Flax Tax" (next target: amber waves of grain); "the manager is an excellent people mutilator" (there's a tough boss); "If this vehicle is being driven in an unusual manner. . . ." (sideways?). With my newfound talent for creative reading, I find the world becoming a more interesting place every day. But I don't want to think about what they serve at the "Human Pagoda" restaurant.

Newspapers, with their small typefaces, present a particularly fertile field. Recently an irate reader of our local paper wrote in to protest that "our tax dollars are being spent for convent auctions!" This was news to me. The government is buying up bankrupt convents? Where will all the nuns go? Whatever use can they make of those tiny cells? Wait a minute—make that "covert actions." Ah.

The striking thing in all these cases is that I didn't feel particularly startled by what I thought I'd read. It is the very complacency these ruminations engender that is their most salient feature. I can read something utterly absurd and tranquilly think it's just a new (though unlikely) bit of information. It's like the sentimental cliché "Strangers are just fiends you haven't met yet." (Make that "friends.") These misreadings seem to be congenial but unfamiliar facts, appearing before us in cheerful attire, inviting us to go for a spin.

In a way, this is a treat. It opens a window on Wonderland. By the time you're a geezerette, you know nearly everything you expect to know in life. Misreadings offer once again a glimpse of the unknown, the world as it was when we were children and a whole lot of things didn't make sense. For many years in early youth, we had daily encounters with completely unlikely facts and idioms. Our task was to make sense of it all, by moving around the furniture in our minds to accommodate the new pieces of information.

But sometimes the trusting acceptance of strange new items was unwarranted. As a child I learned a song that struck me as a little creepy: "My body lies over the ocean, Oh bring back my body to me. . . ." But with childlike patience I filed it away, figuring I'd understand someday, and it was probably just one more example of the strange stuff in the Adult World.

Likewise, my son David missed the word "hands" in a Sunday school song and happily sang, "My pants belong to you, Lord." At that age, it seemed quite possible that someone could be so moved by contemplation of God's authority over the clothing industry as to pen a song about it.

It is this openness and delight in new notions that should ever accompany us. Geezer-enhanced reading skills can offer new opportunities to experience these delights, a garden of renewed childhood springing with brilliant verbal blooms. Let the youngsters have their non-migratory birds. I've found whole new worlds of tantalizing wonder right here in the daily news. As Ogden Nash once observed: "If my vision were twenty-twenty / I should miss miracles a-plenty."

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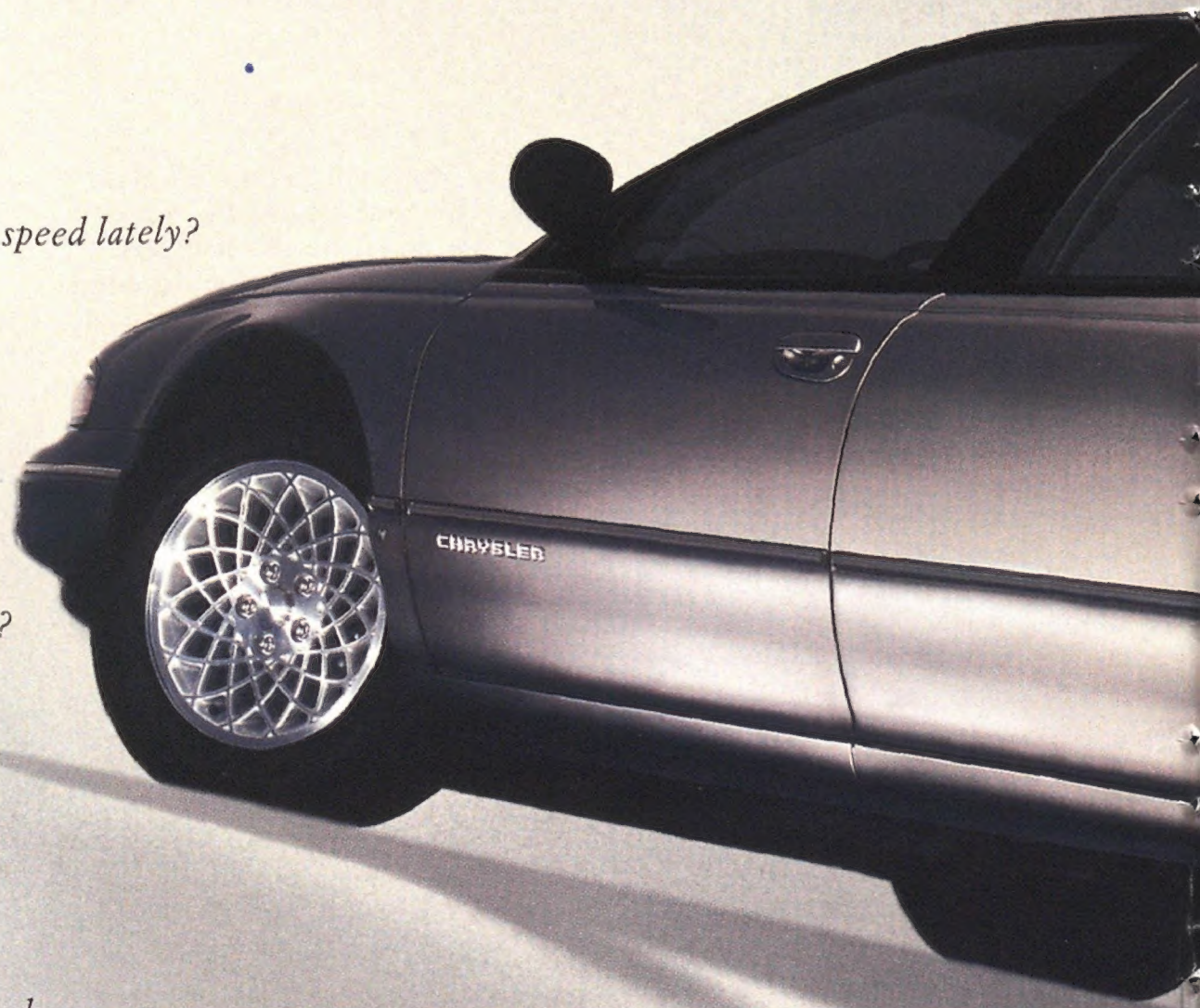

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